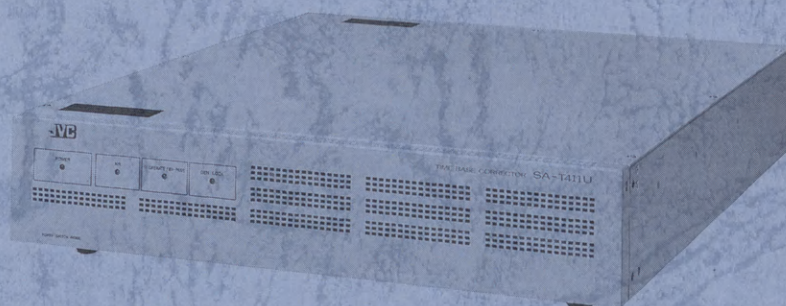


JVC

SERVICE MANUAL

TIME BASE CORRECTOR

SA-T411U



SPECIFICATIONS

GENERAL

AC power requirement: AC 120 V, 50/60 Hz
Power consumption : 95 W
Operating temperature: +5 to 40°C
Operating humidity : 10 to 90 %
Dimensions : 430(W) x 86(H) x 515(D) mm
(16-15/16" x 3-7/16" x 20-5/16")
Weight : Approx. 13 kg (19.9 lbs)

VIDEO

Signal process : Component (Y, R-Y, B-Y = 4:1:1)
Time-base correction : Infinite (1 frame/2 fields)
range
Sampling frequency : Y: 13.5 MHz
C: 3.3 MHz (4:1:1 format)
Sampling rate : Y: 8-bit
C: 8-bit
Frequency response : Y: 5 MHz -3 dB
(Y/C 358, NR-OFF)
C: 3.58 MHz \pm 0.5 MHz -3 dB
Signal-to-noise ratio : 56 dB p-p/rms with quanting effects
(SC trap; on with Shibasoku noise meter)
DG(APL 10% to 90%): 2 %
DP (APL 10% to 90%): 2°
K factor (2T) : 2 % (Heterodyne mode)
H tilt : 1 %
V tilt : 1 %
White clip : 110 IRE

Black clip : 0 IRE
Jitter : Y: \pm 15 nsec
C: \pm 2°
Freeze : Frame/field (A/B) selectable
Auto freeze : Bad video sensor (on/off)
Vertical blanking : On/off selectable

INPUT SIGNAL

Video input
Composite : 1.0 Vp-p, 75 ohms
Y/C 358 : Y: 1.0 Vp-p, 75 ohms
C: 0.286 Vp-p, 75 ohms
Reference input : 1.0 Vp-p (VBS), 0.45 Vp-p (BB)
75 ohms
RF (DOC) input : 0.2 to 1.0 Vp-p, 75 ohms

OUTPUT SIGNAL

Video output
Composite : 1.0 Vp-p, 75 ohms
Y/C 358 : Y: 1.0 Vp-p, 75 ohms
C: 0.286 Vp-p, 75 ohms
Component : Y: 1.0 Vp-p, 75 ohms
R-Y/B-Y: 0.486 Vp-p, 75 ohms } (EIA color bar)
Advanced sync output : 4.0 Vp-p, 75 ohms

ACCESSORIES : Power cord, Rack mount kit

Design and specifications subject to change without notice.

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
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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the  symbol and shaded (■) parts are critical for safety.

Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.

Caution for continued protection against fire hazard.

Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:

- 1) Wires covered with PVC tubing
- 2) Double insulated wires
- 3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:

- | | | |
|--------------------|--------------------------------------|------------|
| 1) Insulation Tape | 3) Spacers | 5) Barrier |
| 2) PVC tubing | 4) Insulation sheets for transistors | |

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

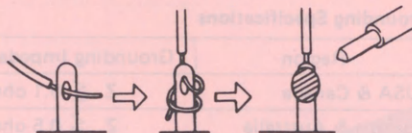


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

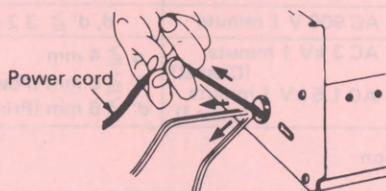


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)

In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1) **Connector part number** : E03830-001

2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.

3) **Replacement procedure**

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).



Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

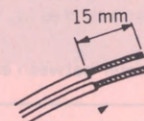


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

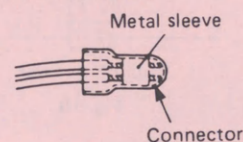


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

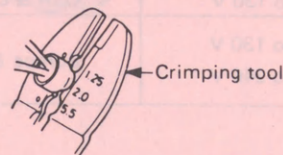


Fig. 6

(5) Check the four points noted in Fig. 7.

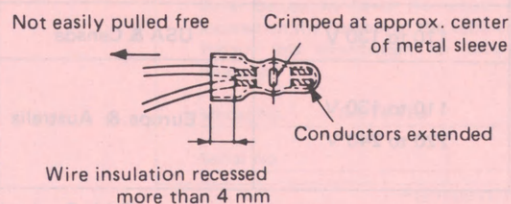


Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

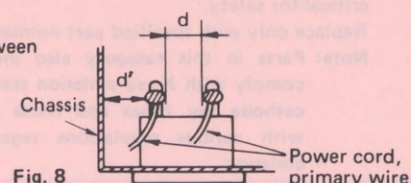
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

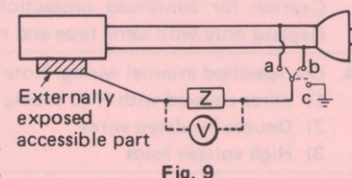


4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

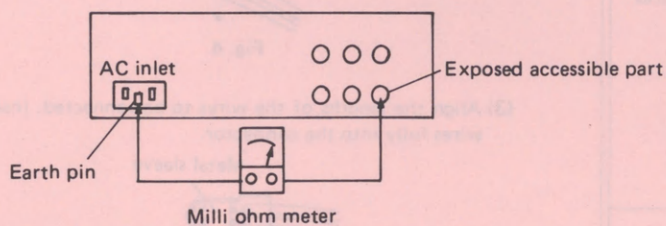


5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.



Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega / 500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V	Europe & Australia	$R \geq 10 \text{ M}\Omega / 500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
200 to 240 V			AC 1.5 kV 1 minute (Class I)	$d' \geq 8 \text{ mm (Power cord)}$ $d' \geq 6 \text{ mm (Primary wire)}$

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F}$ and $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	Europe & Australia	$2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
220 to 240 V		$50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

TIME BASE CORRECTOR



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

This unit should be used with 120 V AC, 60 Hz or 50 Hz only.

CAUTION:
To prevent electric shocks and fire hazards, do NOT use any other power source.

NOTE:
The rating plate (serial number plate) is on the bottom of the unit.

This product complies with D.O.C. Limits (C.R.C., c. 1374) pertaining to class B digital apparatus.

INFORMATION

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate this equipment with respect to the receiver
- Move this equipment away from the receiver
- Plug this equipment into a different outlet so that this equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

ATTENTION
RISQUE D'ELECTROCUTION
NE PAS OUVRI

ATTENTION: POUR EVITER TOUT RISQUE D'ELECTROCUTION, NE PAS OUVRIR LE BOITIER. AUCUNE PARTIE NE DOIT ETRE REGLEE PAR L'UTILISATEUR. SE REFERER A UN AGENT QUALIFIE EN CAS DE PROBLEME.

Le symbole de l'éclair à l'intérieur d'un triangle équilatéral est destiné à alerter l'utilisateur sur la présence d'une "tension dangereuse" non isolée dans le boîtier du produit. Cette tension est suffisante pour provoquer l'électrocution de personnes.

Le point d'exclamation à l'intérieur d'un triangle équilatéral est destiné à alerter l'utilisateur sur la présence d'opérations d'entretien importantes au sujet desquelles des renseignements se trouvent dans le manuel d'instructions.

*Ces symboles ne sont utilisés qu'aux Etats-Unis.

AVERTISSEMENT:
POUR EVITER LES RISQUES D'INCENDIE OU D'ELECTROCUTION, NE PAS EXPOSER L'APPAREIL A L'HUMIDITE OU A LA PLUIE.

Ce magnétoscope ne doit être utilisé que sur du courant alternatif en 120 V, 60 Hz ou 50 Hz.

ATTENTION:
Afin d'éviter tout risque d'incendie ou d'électrocution, ne pas utiliser d'autres sources d'alimentation électrique.

REMARQUE:
La plaque d'identification (numéro de série) se trouve sur le panneau inférieur de l'appareil.

Ce produit est conforme aux normes du M.D.C. (C.R.C., ch. 1374) s'appliquant aux appareils numériques de Classe B.

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PRECAUTIONS

Safety Precautions

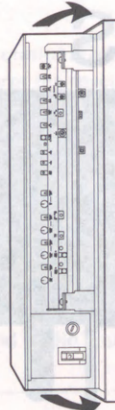
- Use only the power source specified.
- Pay attention not to damage the power cord to prevent fire or shock hazards.
- Pay attention not to allow foreign objects including water, metal and inflammable objects to enter the unit through the ventilation holes, etc. to prevent malfunctions.
- Disconnect the power plug when the unit is not to be used for a long period of time.
- When there is an abnormality, for example a strange odor or smoke, immediately disconnect the power cord and consult your dealer or JVC-authorized service agent.

Handling and Storage

- Avoid using the unit under the following conditions:
 - in extremely hot or cold places,
 - in extremely humid places,
 - near appliances generating strong magnetic fields,
 - in dusty places,
 - in places subject to vibrations, and
 - when it has been moved between places with a large temperature difference.
- Handle the unit carefully.
- Do not block the ventilation openings on the top and rear panels or place anything heavy on the unit.
- Avoid applying violent shocks to the unit during transportation.

Maintenance and Cleaning

- The unit is precision-built for a high performance, and requires periodical maintenance and cleaning for an extended service life. However, as parts replacement and/or adjustment require very sophisticated techniques and equipment, consult your nearest JVC-authorized service agent.



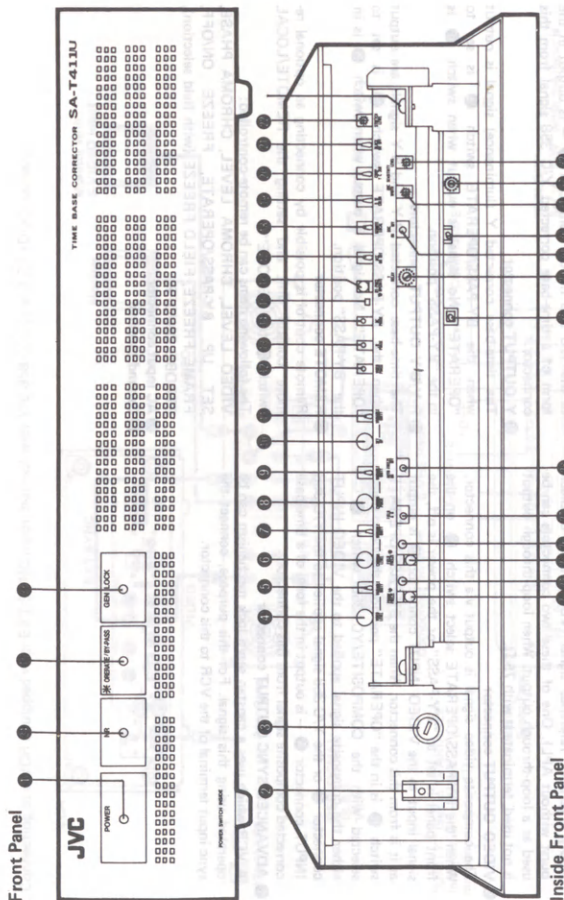
Note: Pull the front panel towards you to open it.

FEATURES

- High picture quality thanks to the component signal processing system with a sampling rate of 4:1 and an 8-bit quantization for each of the Y and C signals. High resolution through use of a wide-band CCD comb filter.
- Simple and dependable connections at input and output of the Y/C separate signals with 7-pin connectors conforming to the YC 358 system.
- Built-in frame memory allowing a wide range of compensation over two fields.
- DOC provided as standard for production of high-quality video images.

- Y signal digital delay line allows the Y/C delay to be adjusted in 16 steps of 74 ns.
- Built-in ACC (Automatic Chroma Level Control) with on/off switch.
- Built-in black stretch circuit with on/off switch.
- Both frame freeze and field freeze (with field selection) are possible either manually or automatically.
- Optional remote control unit.
- Built-in Y and C noise reduction for improved multi-generation dubbing.

CONTROLS AND CONNECTORS

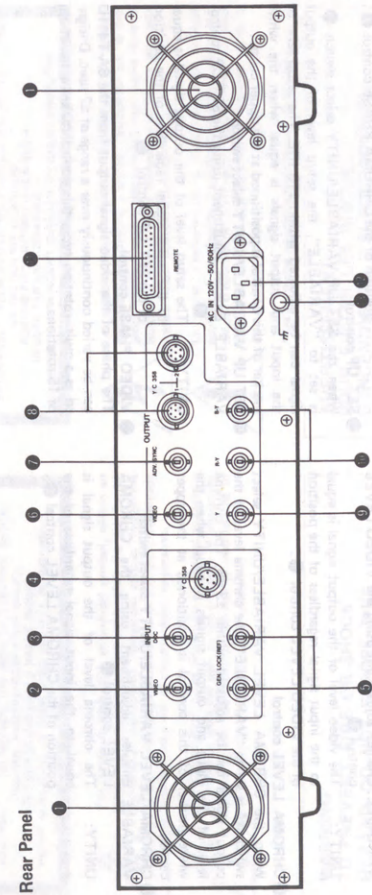


- 1 **POWER indicator**
The video level of the output signal is equal to the input signal regardless of the position of the VIDEO LEVEL control 4.
- 2 **POWER switch**
When the VIDEO LEVEL VARIABLE/UNITY select switch 5 is set to "VARIABLE", the video level of the output signal can be adjusted within ± 3 dB. The video level of the input and output signals is equal when the white marker of this control is positioned at the upper center.
- 3 **FUSE holder**
The video level of the output signal is equal to the input signal regardless of the position of the VIDEO LEVEL control 4.
- 4 **VIDEO LEVEL control**
When the CHROMA LEVEL VARIABLE/UNITY select switch 7 is set to "VARIABLE", the chroma level of the output signal can be adjusted within ± 3 dB. The chroma level of the input and output signals is equal when the white marker of this control is positioned at the upper center.
- 5 **VIDEO LEVEL VARIABLE/UNITY select switch**
VARIABLE: Enables adjustment using the VIDEO LEVEL control 4.
UNITY: The video level of the output signal is equal to the input signal regardless of the position of the VIDEO LEVEL control 4.
- 6 **CHROMA LEVEL control**
When the CHROMA LEVEL VARIABLE/UNITY select switch 7 is set to "VARIABLE", the chroma level of the output signal can be adjusted within ± 3 dB. The chroma level of the input and output signals is equal when the white marker of this control is positioned at the upper center.
- 7 **CHROMA LEVEL VARIABLE/UNITY select switch**
VARIABLE: Enables adjustment using the CHROMA LEVEL control 6.
UNITY: The chroma level of the output signal is equal to the input signal regardless of the position of the CHROMA LEVEL control 6.
- 8 **CHROMA PHASE control**
When the CHROMA PHASE VARIABLE/UNITY select switch 9 is set to "VARIABLE", the chroma phase of the output signal can be adjusted within $\pm 30^\circ$ with reference to the UNITY level.
- 9 **CHROMA PHASE VARIABLE/UNITY select switch**
VARIABLE: Enables adjustment using the CHROMA PHASE control 8.
UNITY: The chroma phase of the output signal is equal to the input signal regardless of the position of the CHROMA PHASE control 8.
- 10 **SET UP control**
When the SET UP VARIABLE/UNITY select switch 11 is set to "VARIABLE", the setup level of the output signal can be adjusted within ± 15 IRE. The setup level of the input and output signals is equal when the white marker of this control is positioned at the upper center.
- 11 **SET UP VARIABLE/UNITY select switch**
VARIABLE: Enables adjustment using the SET UP control 10.
UNITY: The setup level of the output signal is equal to the input signal regardless of the position of the SET UP control 10.
- 12 **VIDEO PHASE control**
The phase of the video signal output from the SA-T411U can be varied continuously over a range of ± 2 μ sec. Designed as a multi-rotation type, this control makes a maximum of 15 rotations.

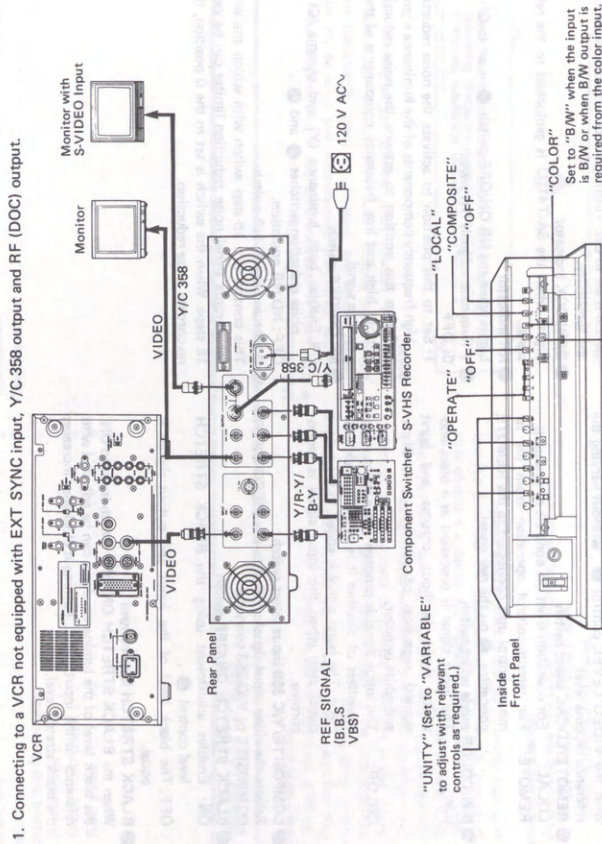
- 13 **H PHASE control**
The horizontal phase of the video signal output from the SA-T411U can be varied continuously over a range of ± 3 μ sec from that of the reference input signal. Designed as a multi-rotation type, this control makes a maximum of 15 rotations. When the input is switched from Y/C 358 to COMPOSITE or vice versa, the horizontal phase must be re-adjusted.
- 14 **SC PHASE control**
The subcarrier phase of the video signal output from the SA-T411U can be varied continuously over a range of $\pm 180^\circ$ from that of the reference input signal (in the Genlock mode). Designed as a multi-rotation type, this control makes a maximum of 15 rotations.
- 15 **OPERATE indicator**
This indicator will light when the BY-PASS/OPERATE switch 16 is set to "OPERATE". In the BY-PASS mode, the indicator is off.
- 16 **BY-PASS/OPERATE switch**
Press to engage the OPERATE mode. In the OPERATE mode, the time-base corrected video signal will be output.
- 17 **ACC ON/OFF switch**
Set to ON to activate the built-in ACC (Automatic Chroma Level Control); the chroma level of the video signal output from the SA-T411U will be automatically adjusted with reference to the burst signal of the input video signal. Then the chroma level can be adjusted with the CHROMA LEVEL control 6 and the luminance level can be adjusted with the VIDEO LEVEL control 4, without varying the reference chroma level.
- 18 **REMOTE/LOCAL select switch**
LOCAL: For operation from the controls of this unit.
REMOTE: For remote-control operation from the remote control unit connected to the REMOTE connector 19 on the rear panel.
- 19 **B/W/COLOR mode select switch**
B/W: The input signal is processed as a black-and-white signal (without chroma and burst signals) regardless of whether it is black-and-white or color.
COLOR: The input signal is processed as a color signal regardless of whether it is black-and-white or color. The burst signal is added to the output signal even when the input signal is monochrome.
- 20 **COMPOSITE/Y/C 358 input select switch**
Selects the video input signal applied to the VIDEO INPUT COMPOSITE or Y/C 358 connector.
- 21 **BLACK STRETCH ON/OFF switch**
ON: Enables adjustment using the BLACK STRETCH level control 22.
OFF: The black level of the input and output signals is equal.
- 22 **BLACK STRETCH level control**
When the BLACK STRETCH ON/OFF switch is set to ON, the black level of the luminance signal can be adjusted with reference to the input signal. Turning it clockwise increases the black stretch level.
- 23 **FRAME FREEZE button**
Press for frame freeze operation. Pressing again will release the frame freeze.
- 24 **FRAME FREEZE indicator**
Lights in the Frame Freeze mode.
- 25 **FIELD FREEZE button**
Press for field freeze operation. Pressing again will release the field freeze.
- 26 **FIELD FREEZE indicator**
Lights in the Field Freeze mode.
- 27 **FIELD A/B select switch**
Selects one of the two field signals in the frame memory which is to be output.
- 28 **AUTO FREEZE ON/OFF switch**
In the ON position, the output video signal freezes automatically when the input video signal is interrupted.
- 29 **Y/C DELAY control**
Controls the delay of the Y signal in 16 steps; each step corresponds to 74 ns.
- 30 **DOC ON/OFF switch**
ON: To use the SA-T411U's DOC.
OFF: To use the VCR's DOC.
- 31 **DOC WIDTH control**
With the DOC ON/OFF switch 30 set to ON, this control allows adjustment of the reference width of dropouts that can be detected.
- 32 **DOC SENSITIVITY LEVEL control**
The DOC sensor level can be adjusted when the DOC switch is set to ON. Turning this control clockwise increases the sensitivity.
- 33 **GENLOCK indicator**
Lights when the SA-T411U is genlocked to the reference signal.
- 34 **NR indicator**
Lights when the NR ON/OFF switch 35 is set to ON.
- 35 **Y (luminance signal) NR switch**
0: OFF
1: Set to this position to activate the noise reduction for high frequency components of the luminance signal.
2: Set to this position to activate the noise reduction for both high and low frequency components of the luminance signal.
- 36 **NR ON/OFF switch**
ON: Enables both luminance (Y) and chroma (C) signal noise reduction switches 35 and 37.
OFF: NO NR operation.
- 37 **C (chroma signal) NR switch**
This control is a 16-step switch with which the width of the chroma signal noise reduction limiter can be varied in 15 steps. When the switch is set to the 0 position, there is no chroma noise reduction.

CONNECTIONS

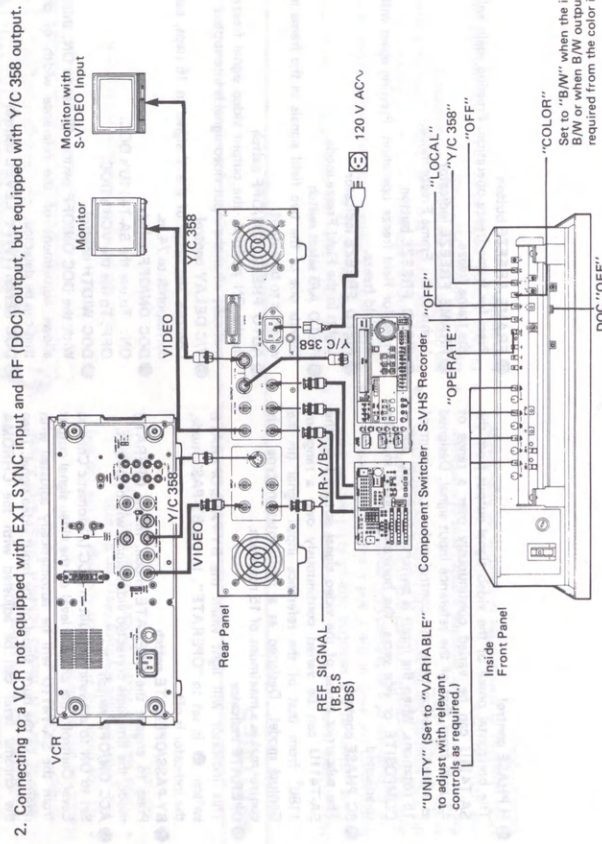
CONNECTIONS



- 1 **Fans**
- 2 **VIDEO INPUT connector**
Connect to the video output terminal of a VCR.
- 3 **VIDEO OUTPUT connector**
Apply the video playback RF signal for detecting dropouts in the VCR's output.
- 4 **Y/C 358 INPUT connector**
Receives Y/C 358 video signals (luminance and 3.58 MHz chroma) from an S-VHS recorder via a Y/C cable (optional).
- 5 **GENLOCK REFERENCE INPUT connectors**
Apply a genlock reference signal (VBS 1 Vp-p, or black burst without APL). One of these two connectors can be used as a loop-through output. When loop-through output is not used, terminate it with 75 Ω .
- 6 **VIDEO OUTPUT connector**
The composite video signal is output via this connector. When the BY-PASS/OPERATE select switch ⑨ on the front panel is set to "BY-PASS" or the power is off, the signal input to the VIDEO INPUT connector ② is output as it is from this connector. When the BY-PASS/OPERATE switch ⑨ is in the "OPERATE" position, the video signal selected with the COMPOSITE/YC 358 switch ⑩ — either the composite signal applied to the VIDEO INPUT connector ② or the Y/C 358 signal applied to the Y/C 358 INPUT connector ④ — is output in the form of a time-base corrected Y/C 358 signal from this connector.
- 7 **ADVANCED SYNC OUTPUT connector**
A VCR which uses a capstan servo lock mechanism can be operated using this signal. For this purpose, connect the sync input terminal of the VCR to this connector.
- 8 **AC input connector**
- 9 **Y/C 358 OUTPUT connectors (1 and 2)**
The Y/C 358 signal (luminance and 3.58 MHz chroma) is output via this connector. When the BY-PASS/OPERATE select switch ⑨ on the front panel is set to "BY-PASS" or the power is off, the signal input to the Y/C 358 INPUT connector ④ is output as it is from the Y/C 358 OUTPUT-1 connector. When switch ⑨ is in the "OPERATE" position, the video signal selected with the COMPOSITE/YC 358 switch ⑩ — either the composite signal applied to the VIDEO INPUT connector ② or the Y/C 358 signal applied to the Y/C 358 INPUT connector ④ — is output in the form of a time-base corrected Y/C 358 signal from this connector.
- 10 **Y OUTPUT connector**
The time-base corrected Y (luminance) signal is output when the BY-PASS/OPERATE switch ⑨ is set to "OPERATE". No signal is output when switch ⑨ is in the "BY-PASS" position.
- 11 **R-Y/B-Y OUTPUT connectors**
The time-base corrected R-Y and B-Y signals are output when the BY-PASS/OPERATE switch ⑨ is set to "OPERATE". No signal is output when switch ⑨ is in the "BY-PASS" position.
- 12 **REMOTE connector**
Remote control is possible by connecting an optional remote control unit and setting the REMOTE/LOCAL switch ⑪ to "REMOTE".
The following items can be remote-controlled:
VIDEO LEVEL, CHROMA LEVEL, CHROMA PHASE, SET UP, BY-PASS/OPERATE, FREEZE ON/OFF, FRAME FREEZE, FIELD FREEZE (with field selection), STROBE ON/OFF.
- 13 **AC input connector**
- 14 **Ground terminal**



1. Connecting to a VCR not equipped with EXT SYNC input, Y/C 358 output and RF (DOC) output.



2. Connecting to a VCR not equipped with EXT SYNC input and RF (DOC) output, but equipped with Y/C 358 output.

SPECIFICATIONS

GENERAL

AC power requirement: AC 120 V, 50/60 Hz

Power consumption : 95 W

Operating temperature : +5 to 40°C

Operating humidity : 10 to 90 %

Dimensions : 430(W) x 96(H) x 515(D) mm
(16-15/16" x 3-7/16" x 20-5/16")

Weight : Approx. 13 kg (19.9 lbs)

VISUAL

Video process : Component (Y, R-Y, B-Y = 4:1:1)

Time-base correction : Infinite (1 frame/2 fields)

Sampling frequency : Y: 13.5 MHz

C: 3.3 MHz (4:1:1 format)

C: 8-bit

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INPUT SIGNAL

Video input

Composite

Y/C 358

Reference input

RF (DOC) input

Video output

Composite

Y/C 358

Component

Y: 1.0 Vp-p, 75 ohms

C: 0.286 Vp-p, 75 ohms

Y: 1.0 Vp-p, 75 ohms

C: 0.286 Vp-p, 75 ohms

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C: 0.286 Vp-p, 75 ohms

OUTPUT SIGNAL

Video output

Composite

Y/C 358

Reference input

RF (DOC) input

Video output

Composite

Y/C 358

Component

Y: 1.0 Vp-p, 75 ohms

C: 0.286 Vp-p, 75 ohms

Y: 1.0 Vp-p, 75 ohms

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Y: 1.0 Vp-p, 75 ohms

C: 0.286 Vp-p, 75 ohms

ACCESSORIES

Advanced sync output : 4.0 Vp-p, 75 ohms

Power cord, Rack mount kit

Design and specifications subject to change without notice.

Signal-to-noise ratio : 56 dB p-p/rms with quantizing effects

DG (APL 10% to 90%): 2 %

DP (APL 10% to 90%): 2 %

K factor (2T) : 2 % (Heterodyne mode)

H tilt : 1 %

V tilt : 1 %

White clip : 110 IRE

Black clip : 0 IRE

Jitter : Y: ±15 nsec

C: ±2°

Freeze : Frame/field (A/B) selectable

Auto freeze : Bad video sensor (on/off)

Vertical blanking : On/off selectable

Freeze : Frame/field (A/B) selectable

Auto freeze : Bad video sensor (on/off)

Vertical blanking : On/off selectable

Freeze : Frame/field (A/B) selectable

Auto freeze : Bad video sensor (on/off)

Vertical blanking : On/off selectable

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Auto freeze : Bad video sensor (on/off)

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Freeze : Frame/field (A/B) selectable

Auto freeze : Bad video sensor (on/off)

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Freeze : Frame/field (A/B) selectable

Auto freeze : Bad video sensor (on/off)

Vertical blanking : On/off selectable

Freeze : Frame/field (A/B) selectable

Auto freeze : Bad video sensor (on/off)

Vertical blanking : On/off selectable

Freeze : Frame/field (A/B) selectable

DISASSEMBLY

1. Removing External Covers

1.1 Top cover

- (1) Remove seven screws (1), then dismount the cover by lifting it.

1.2 Front panel

- (1) Remove the SW & fuse bracket. Remove five screws (2), then pull the panel forward.

1.3 Rear panel

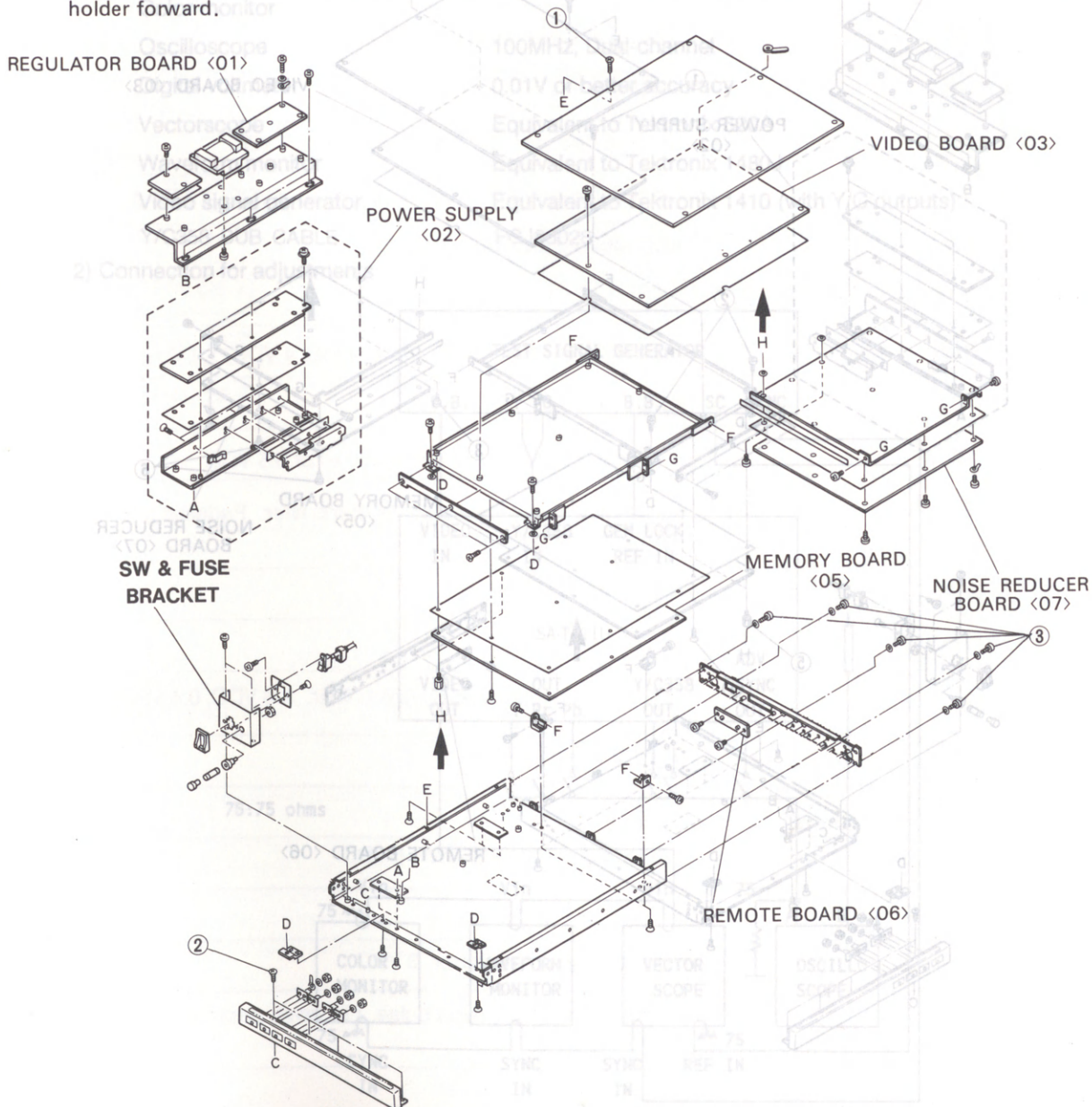
Note : Be sure to turn off the power before removing the connector.

- (1) Remove the top cover. Remove seven screws (3), disconnect the connector from the board, then dismount the panel.

2. Removing the Fuse

Note: Carefully handle the plastic fuse holder which may be broken easily.

- (1) Turn the fuse holder about a 1/8 rotation counterclockwise while pressing it with a slotted screwdriver, then pull the holder forward.



3. Removing Main Boards

Note: Be sure to turn off the power before removing or installing a board. Be sure to install the removed boards and connectors at their original positions.

3.1 VIDEO board

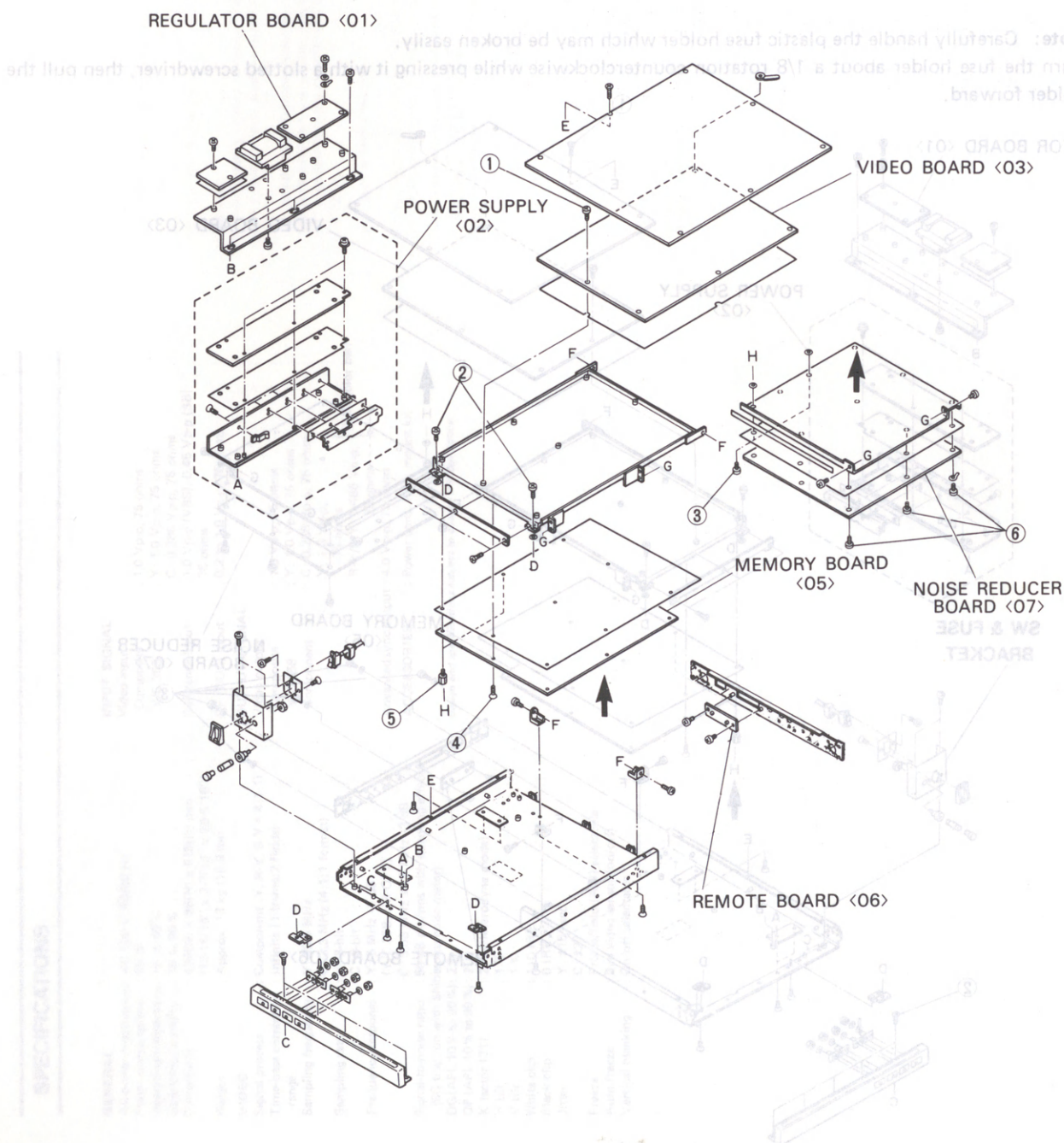
- (1) Remove nine screws (1) to remove the VIDEO board.

3.2 MEMORY board

- (1) Remove two screws (2), then raise the bracket.
- (2) Remove two screws (3), then open the bracket of the NR board. Remove seven screws (4) and two posts (5) to remove the MEMORY board.

3.3 NR board

- (1) Take step (1) of 3.2.
- (2) Remove eight screws (6) to remove the NR board.



SECTION 1 ELECTRICAL ADJUSTMENT

1-1. INTRODUCTION

This section includes descriptions of the SA-T411U's adjustment procedures and methods. Consult this section whenever a problem occurs with the SA-T411U, or when readjustments are required.

Section 1-2 describes the connections and instruments required when making adjustments.

Section 1-3 describes the various signals found on the test points provided on each printed circuit board.

Section 1-4 describes the methods and procedures used for adjustments.

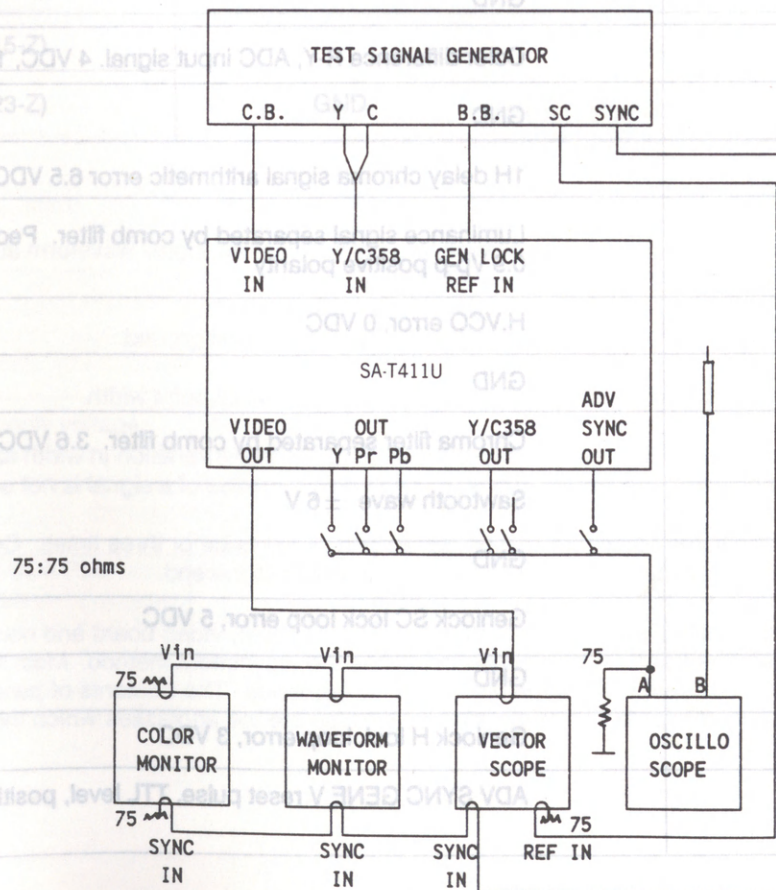
1-2. PREPARATION

1) Required Instruments

When making adjustments, instruments with the following or better performance are required:

Color monitor	
Oscilloscope	100MHz, Dual-channel
Digital voltmeter	0.01V or better accuracy
Vectorscope	Equivalent to Tektronix 520A
Waveform monitor	Equivalent to Tektronix 1480J
Video signal generator	Equivalent to Tektronix 1410 (with Y/C outputs)
Y/C358 DUB CABLE	PGJ05028

2) Connection for adjustments



1-3. CHECK POINTS

1-3-1. Video Board

- The following is a description of each test point on the printed circuit board. (The EIA color bar signal is connected to VIDEO IN and the BB signal is connected to GEN LOCK IN. Each control is set to the UNITY side and INPUT SELECT is set to COMPOSITE.)

Test point	Description
TP1 (1-B)	GND
TP2 (1-N)	
TP3 (1-Z)	
TP4 (3-Z)	Luminance ADC input signal. Pedestal 3 VDC, 1.8 Vp-p positive polarity
TP5 (5-A)	Band limited (1MHz -6dB) luminance signal. Pedestal 1 VDC, 6 Vp-p positive polarity
TP6 (5-B)	Sync signal slice level 0.1 VDC
TP7 (6-H)	GND
TP8 (5-L)	Chroma decoder; Burst lock VCO error 7 VDC
TP9 (5-U)	Color difference B-Y, ADC input signal. 4 VDC, 1.2 Vp-p
TP10 (5-W)	ADC reference voltage (5 VDC)
TP11 (8-N)	GND
TP12 (7-U)	Color difference R-Y, ADC input signal. 4 VDC, 1.2 Vp-p
TP13 (7-V)	GND
TP14 (10-M)	1H delay chroma signal arithmetic error 6.5 VDC
TP15 (9-P)	Luminance signal separated by comb filter. Pedestal 5 VDC, 0.9 Vp-p positive polarity
TP16 (9-V)	H.VCO error, 0 VDC
TP17 (14-J)	GND
TP18 (11-P)	Chroma filter separated by comb filter. 3.6 VDC, 0.4 VP-P
TP19 (12-S)	Sawtooth wave ± 6 V
TP20 (11-Y)	GND
TP21 (18-D)	Genlock SC lock loop error, 5 VDC
TP22 (20-D)	GND
TP23 (17-E)	Genlock H lock loop error, 3 VDC
TP24 (20-L)	ADV SYNC GENE V reset pulse, TTL level, positive polarity

Test point	Description
TP25 (28-J)	GND
TP26 (29-D)	S (Y/C358) chroma signal, 0.5 VDC, 1.2 Vp-p
TP27 (29-N)	Component color difference PR signal, 0.3 VDC, 1.4 Vp-p (BETACAM), 1 Vp-p (MII)
TP28 (30-N)	GND
TP29 (32-C)	Composite video signal, pedestal -0.5 VDC, 2 Vp-p
TP30 (32-C)	GND
TP31 (31-M)	Component color difference PB signal, 0.3 VDC, 1.4 Vp-p (BETACAM), 1 Vp-p (MII)
TP32 (31-V)	GND
TP33 (31-D)	S (Y/C358) luminance signal, pedestal -1 VDC, 2 Vp-p
TP34 (33-M)	Component luminance signal, pedestal -0.5 VDC
TP35 (32-Y)	DAC reference voltage 4 VDC
TP36 (33-Z)	
TP37 (26-T)	GND
TP38 (14-Y)	WR VD pulse, TTL level positive polarity
TP39 (25-X)	FIELD DET pulse TTL level positive polarity
TP40 (15-Z)	
TP41 (23-Z)	GND

1-4-1. General description

Before performing adjustments, it is necessary to confirm that the signal waveform at the point where adjustment is to be performed is not normal.

Use the ground terminal nearest the test point as the oscilloscope ground.

Unless otherwise noted, the pulse width in this section is a measure of the pulse width.

The expression "approx." used in this section is used to cover the variation in width caused by random variations in components and is also used when the value of a signal is not so critical.

In this section, the same adjustment is sometimes performed twice or three times. Consequently, it is necessary to perform adjustment in numerical order right to the end.

Adjustment of the 8A-T4TU operates correctly, the memory board, video board and noise reducer board must each be operated correctly. This section describes the adjustment method. Most adjustments concern the video board. Perform them in the following sequence. The contents of parentheses in the check point and adjustment columns of the following tables are the addresses which indicate the position on the board.

1-3-2 Power supply

The values shown in the table are the voltages measured at the power connector of the video board, memory board and noise reducer board with a digital voltmeter.

Test point	Measured value
VIDEO BOARD J10 (29-Z)	1 +4.85V ~ +5.15V
	2,4 GND
	3 -4.85V ~ -5.15V
	5 +11.64V ~ +12.36V
	6 -11.64V ~ -12.36V
MEMORY BOARD J2 (10-S)	1,2 GND
	3 -4.85V ~ -5.15V
	4 -11.64V ~ -12.36V
MEMORY BOARD J3 (10-U)	1 +11.64V ~ +12.36V
	2,3 +4.85V ~ +5.15V
NOISE REDUCER BOARD CN6	1 +8.73V ~ +9.27V
	2 +4.85V ~ +5.15V
	3 GND
	4 -4.85V ~ -5.15V

1-4. ADJUSTMENT PROCEDURE

1-4-1. General description

Before performing adjustments, it is necessary to confirm that the signal waveform at the point where adjustment is to be performed is not normal.

Use the ground terminal nearest the test point as the oscilloscope ground.

Unless otherwise noted, the pulse width in this section is a mesial point width.

The expression "approx." used in this section is used to cover the variation in width caused by random variations in components and is also used when the value of a signal is not so critical.

In this section, the same adjustment is sometimes performed twice or three times. Consequently, it is necessary to perform adjustment in numerical order right to the end.

* To ensure that the SA-T411U operates correctly, the memory board, video board and noise reducer board must each be operated correctly. This section describes the adjustment method. Most adjustments concern the video board. Perform them in the following sequence. The contents of parenthesis in the check point and adjustment columns of the following tables are the addresses which indicate the position on the board.

1-4-2. Control setting

* Unless otherwise noted, set the various switches and controls to the condition indicated below.

Switches and Controls	Boards	Setting
BYPASS/OPERATE	VIDEO BOARD	OPERATE
ACC		OFF
REMOTE/LOCAL		LOCAL
B/W/COLOR		COLOR
BLACK STRETCH		OFF
VIDEO LEVEL		UNITY
CHROMA LEVEL		
CHROMA PHASE		
SET UP		
SC TRAP (3-P)		OFF
SYNC (29-M)		OFF
FRAME FREEZE	MEMORY BOARD	OFF
FIELD FREEZE		OFF
AUTO FREEZE		OFF
DOC		ON
NR	NOISE REDUCER BOARD	OFF
SW4		ON
SW5		ON

1-4-3. Memory board

No.	Item	Check point	Adjustment point	Signal	Mode	Adjustment and confirmation
1	Power supply voltage check	According to sub-section 1-3-2				Measure with a digital voltmeter and confirm that the measured value is within the range indicated in sub-section 1-3-2.
2	READ CLOCK PLL adjustment	IC 10E-2	VC1 (10E)			Using an oscilloscope, observe the voltage at pin 2 of IC10E and adjust VC1 so that the voltage becomes 4.3 VDC.

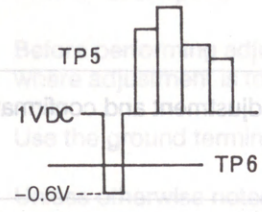
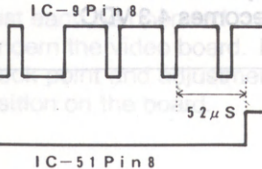
1-4-4. Video board

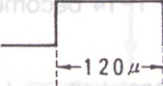
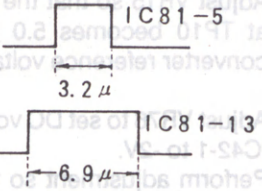

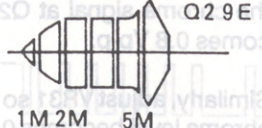
Unless otherwise noted, when performing the following adjustments, ensure that the switches and controls are in the condition of 1-4-2 "Control setting".


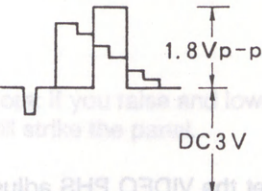

COMP mode	Input the measuring signal to VIDEO IN (BNC connector). Set the COMP/Y/C358 select switch to the COMP side. Unless otherwise noted, set the other switches to the condition of sub-section 1-4-2.
Y/C358 mode	Input the measuring signal to Y/C358 (7-pin connector). Set the COMP/Y/C selector switch to the Y/C358 side. Unless otherwise noted, set the other switches to the condition of sub-section 1-4-2.
GEN LOCK mode	Input a Black Burst signal to GEN LOCK IN. Unless otherwise noted, set the other switches to the condition of sub-section 1-4-2.
B/W mode	Set the B/W/COLOR selector switch to B/W. Unless otherwise noted, set the other switches to the condition of sub-section 1-4-2.
ACC mode	Set the ACC ON/OFF selector switch to ON. Unless otherwise noted, set the other switches to the condition of sub-section 1-4-2.

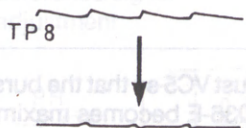

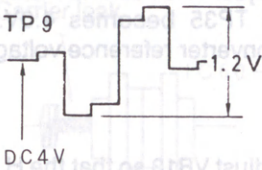
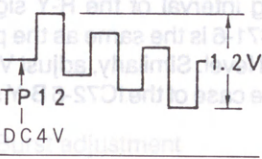


Note: If you raise and lower the video board with the front panel closed, the controls and switches will strike the panel.

1. Input process

No.	Item	Check point	Adjustment point	Signal	Mode	Adjustment or check
3	INPUT 2nd sync separation adjustment 	TP5 (5A) TP6 (5B)	VR12 (5C)	EIA color bars	COMP Y/C358	Confirm that a band-limited (1 MHz, -6 dB) luminance signal (pedestal potential 1 VDC, 6 Vp-p) is output to TP5. Next, adjust VR12 so that TP6 becomes 0.1 VDC. Also, confirm that when VR12 is turned fully right or left, it changes between SYNC TIP level (-0.6V) and pedestal level (1 V). Confirm that the same result is obtained even when the mode is switched.
4	INPUT V sync separation adjustment 	IC9-8 (4B), IC51-8 (15J)	VR36 (14M)	EIA color bars	COMP	Measure with a dual beam oscilloscope. Adjust VR36 so that the fall of the IC51-8 signal comes to a point 52 μsec from the rise of the 3rd serration of IC9-8.


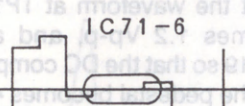
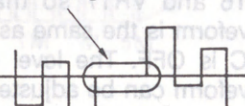
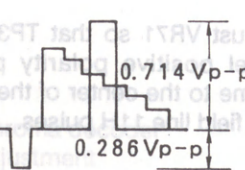
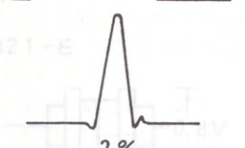
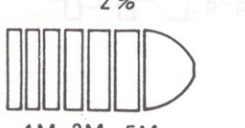
No.	Item	Check point	Adjustment point	Signal	Mode	Adjustment and confirmation
5	FIELD DET pulse adjustment 	TP38 (14Y)	VR69 (17Y)	EIA color bars	COMP	Adjust VR69 so that the width of the TP38 TTL level positive polarity pulse becomes 120 μsec.
6	SYNC width gate adjustment 	IC81-5, IC81-13 (26R)	VR62 VR63 (26R)	EIA color bars	COMP	Using an oscilloscope, adjust VR62 so that the width of the IC81-5 TTL level positive polarity pulse becomes 3.2 μsec. Similarly, adjust VR63 so that the width of IC81-13 becomes 6.9 μsec.
7	H.VCO (sawtooth wave) adjustment Error waveform  TP16 V blanking TP19 +6V -6V 37.5 μs	TP16 (9V) TP19 (12S)	L9 (9V) VR24 (10T) VR32 (13T)	EIA color bars	COMP	Set the VIDEO PHS adjustment potentiometer and VR32 (13T) on the front of the video board to the center position. Adjust L9 so as to eliminate the DC misalignment at the V blanking period and the H period of the TP16 waveform. Set VR24 so that the error waveform is slightly less than maximum. Adjust VR32 so that the sloping part of the sawtooth waveform of TP19 is 37.5 μsec.
8	Comb filter adjustment 	IC10-1 (5E) Q24-E (10B) Q29-E (12H)	VR75 (4E) VR27 (10A) L12, L13, L14 (12E)	SWEEP	COMP	Adjust VR75 to set DC voltage at IC10-1 to -3.5V. Using an oscilloscope, perform adjustment so that the waveform of Q24-E is flat. Using an oscilloscope, observe the waveform at Q29-E, then pull the cores of L12 and L14 right out, fully insert the core of L13, and perform adjustment so that the waveform shown in the figure at left is obtained.

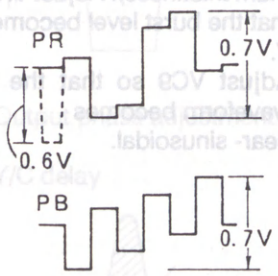

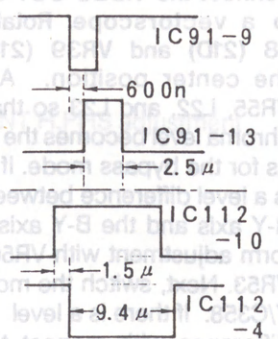
No.	Item	Check point	Adjustment point	Signal	Mode	Adjustment or check
8	(13M) VR30 	TP14 (10M)	VR29 (11M), L15, L16 (11K)	EIA color bars		Set VR30 (13M) as shown in the figure at left. Rotate VR29, L15, and L16 so that the chroma component of TP14 becomes minimum.
		TP15 (9P)	VR23 (10N), L10, L11 (11B)	EIA color bars	COMP	Adjust VR23, L10, and L11 so that the chroma component of the (Y/C separated) brightness signal of TP15 becomes minimum.
9	Y. AD converter adjustment 	TP10 (5W)	VR15 (5Z)			Adjust VR15 so that the voltage at TP10 becomes 5.0 V. (A/D converter reference voltage)
		TP4 (3Z) IC42-1 (12N)	VR9 (2S) VR10 (1W) VR76 (13P)	EIA color bars	Y/C358	Adjust VR76 to set DC voltage at IC42-1 to -2V. Perform adjustment so that the luminance signal component of the TP4 signal becomes 1.8 V. Next, adjust VR9 so that the pedestal potential of the Y signal at TP4 becomes 3 VDC.
			VR4 (3K)	2T pulse		Adjust the K-FACTOR to 2% with VR4.
			VC1 (2S) L3, L5 (2N)	SWEEP		Rotate VC1, L3, and L5 so that the frequency response becomes 5 MHz \pm 0.2 dB.
			VR28 (2H)	EIA color bars	COMP	Adjust VR28 so that the luminance signal component becomes 1.8 V.
			VC14 (9R)	SWEEP		Adjust VC14 so that the frequency response becomes 5 MHz -3dB.
10	Chroma decoder adjustment 	Q21-E (9E)	VR21 (9E)	EIA color bars	Y/C358	Adjust VR21 so that the level of the chroma signal at Q21-E becomes 0.8 Vp-p.
		IC30-1 (9F)	VR31 (11N) VR22 (10F)		COMP	Similarly, adjust VR31 so that the chroma level becomes 0.8 Vp-p. Adjust VR22 so that the DC level at IC30-1 becomes 4 V.

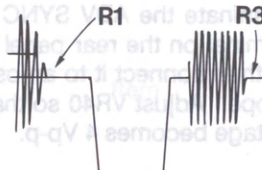

No.	Item	Check point	Adjustment point	Signal	Mode	Adjustment or check
	 	TP8 (5K)	VC2 (5M) VC3 (7L)			If the burst lock VCO error at TP8 is not a straight line, adjust VC2 and VC3 to make the error a straight line.
		TP12 (7U) TP9 (4U)	VR18 (7E)	Full color bar B-Y cut, R-Y cut		Set VR20 (7T) and VR14 (4T) to the center position. Observe the voltage at TP12 and TP9 with an oscilloscope. Cut the B-Y axis component from the input signal. At this time, rotate VR18 so that the waveform at TP12 becomes a straight line. Next, cut R-Y and once again adjust VR18 so that the waveform at TP9 becomes a straight line. Set VR18 so that the voltages at TP9 and TP12 are average.
11	Color difference A/D converter adjustment	TP9 (4U) TP12 (7U)	VR13 (5T) VR14 (4T) VR19 (6T) VR20 (7T)	EIA color bars		Adjust VR14 so that the waveform at TP7 becomes 1.2 Vp-p. Next, adjust VR13 so that the DC component of the pedestal becomes 4 V. Adjust VR20 so that the waveform at TP12 becomes 1.2 Vp-p, and adjust VR19 so that the DC component of the pedestal becomes 4 V.
	 		VR16 (6D) VR17 (7E)		ACC	Set the ACC switch on the front of the video board to ON. Adjust VR16 and VR17 so that the waveform is the same as when ACC is OFF. The level of the waveform can be adjusted with VR16, and the phase can be adjusted with VR17.
12	WRITE FIELD pulse adjustment	IC9-8 (4B) TP39 (24W)	VR71 (25Z)	EIA color bars		Adjust VR71 so that TP39 TTL level positive polarity pulses come to the center of the IC9-8 1st field line 11H pulses.
	 					

2. Output process

Note : Output process adjustment is performed after those described in the sections 1.4.5 and 1.4.6 are done.

No.	Item	Check point	Adjustment point	Signal	Mode	Adjustment or check
13	Gen lock adjustment,  (SC lock adjustment)	Q36-E (15D) TP21 (19C)	VC5 (16D) VC7 (19E) VR37 (17D) VR34 (13Z)		G E N LOCK	Adjust VC5 so that the burst level at Q36-E becomes maximum (approx. 1.5 Vp-p). Adjust VC7 so that the waveform at TP21 becomes 5 VDC, and adjust VR37 and VR34 so that it becomes a straight line. (Observe with an oscilloscope using the V rate.)
	(H lock adjustment)	TP23 (17F)	L21 (17L)			Adjust L21 so that the waveform of TP23 becomes 3 VDC.
14	D/A converter adjustment  H blanking 	TP35 (32Y) IC71-6 (31Z) IC72-6 (32Z)	VR54 (30X) VR13 (5T) VR19 (6T)		G E N LOCK	Adjust VR54 so that the DC level of TP35 becomes 4.0V. (D/A converter reference voltage)
				EIA color bars	COMP	Adjust VR13 so that the H blanking interval of the R-Y signal at IC71-6 is the same as the pedestal level. Similarly, adjust VR19 in the case of the IC72-6 B-Y signal.
15	Component Y signal adjustment   	Rear panel Y OUT (BNC connector)	VR43 (23H) VR58 (32P) VR59 (32V) L40, L41 (33T) VR57 (33P) VC13 (33P)	EIA color bars 2T pulse SWEEP	Y/C358	Terminate Y OUT on the rear panel in 75 Ω , and connect it to an oscilloscope. Adjust VR43 so that the sync signal becomes 0.286 V. Adjust VR58 so that the video level becomes 0.714 V. Adjust VR59 so that the K factor becomes less than 2%. 8. Adjust L40, L41, VR57, and VC13 so that the frequency response becomes 5 MHz \pm 0.2 dB.

No.	Item	Check point	Adjustment point	Signal	Mode	Adjustment or check
16	Component color difference signal adjustment 	Rear panel PR OUT, Pb OUT (BNC connector)	VR49 (29S) VR52 (31R) S13 (29M) VR48 (29M)	EIA color bars	Y/C358	Terminate PR OUT on the rear panel with 75 Ω , and connect it to an oscilloscope. Adjust VR49 so that the signal becomes 0.7 Vp-p. Next, set S13 to ON. Adjust VR48 so that the sync signal level becomes 0.6 V. After adjustment, set S13 to OFF. Next, terminate Pb with 75 Ω , and connect it to an oscilloscope. Adjust VR52 so that the signal becomes 0.7 Vp-p.
17	Chroma encoder input level adjustment	IC61-1 (26M) IC63-1 (28J)	VR50 (29V) VR53 (31U)	EIA color bars	Y/C358	Adjust VR50 so that the signal level of IC61-1 is 0.4 Vp-p. Adjust VR53 so that the signal level of IC63-1 is 0.4 Vp-p.
18	Chroma encoder carrier adjustment 	IC60-8 (26F)	VR47 (29K) VR45 (26L)	REV color bars		Adjust VR47 and VR45 so that the carrier leak component of the chroma signal becomes minimum. (Perform adjustment so that the line at the position shown in the figure becomes minimum thickness.)
19	Burst adjustment 	IC91-9 (24T) IC91-13 (27Y) IC112-10 (27Y) IC112-4	VR68 (24U) VR61 (24S) VR72 (26Z) VR70 (27W)		G E N LOCK	Using a dual beam oscilloscope, adjust VR68 so that the interval between the fall of the IC91-9 TTL level negative pulse and the rise of the IC91-13 TTL level positive pulse is 600 ns. Also, adjust the IC91-13 pulse width with VR61. Similarly, adjust VR72 so that the interval between the rise of the IC112-10 TTL level positive pulse and the fall of the IC112-4 TTL level negative pulse is 1.5 μ sec, and also adjust the IC112-4 pulse width with VR70.

No.	Item	Check point	Adjustment point	Signal	Mode	Adjustment or check
		Rear panel, VIDEO OUT (BNC connector)	C-BLK R1 R3	EIA Color bars	COMP	Measure the H blanking with an oscilloscope or a waveform monitor and adjust the chroma blanking using R1 and R3 on the C-BLK board.
21	Output phase adjustment Y/C delay 	Rear panel, VIDEO OUT (BNC connector)	H.PHS. VR (front edge) VR32 (13T), Y.DELAY (memory board front edge)	2T pulse bars	COMP	Set the waveform monitor (oscilloscope) to external sync, then, using the H.PHS control, align the H SYNC phase for the bypass mode with the H sync phase for the operation mode. Next, operate the Y.DELAY SW and adjust the Y/C delay to the optimum position. (Perform the above adjustment using the pulse and bar 20T modulation portion.) Next, using the rise portion of the 2T bar, eliminate the difference in phases between the bypass and operation modes with VR32.
22	Y/C358 adjustment	Rear panel Y/C358 OUT (7-pin)	VR51 (30F) VC12 (31F) VR46 (29E) VC10 (29D) VR44 (26D)	EIA color bars SWEEP	Y/C358	Terminate Y/C358 OUT on the rear panel in 75 Ω , and connect it to an oscilloscope. Adjust VR51 so that the luminance level becomes equal to the value for the bypass mode. Adjust the frequency response using VC12. Next, rotate VR44 fully left, and set VR46 to the center position. Adjust VC10 so that the chroma signal level becomes the same as for the bypass mode.
23	INT H.PHS adjustment	Rear panel VIDEO OUT (BNC connector)	VR33 (12Z) VC6 (19D)	EIA color bars		Set the sync selector of the waveform monitor to INTERNAL. Set the sync selector of the vectorscope to EXTERNAL. Using a waveform monitor, observe the phase difference between the waveforms in the bypass and operation modes, and adjust VR33 so as to eliminate the phase difference. Using a vectorscope, adjust VC6 so that the rotating speed of the vector in the operation mode becomes minimum.

No.	Item	Check point	Adjustment point	Signal	Mode	Adjustment or check
24	ADV.SYNC adjustment	Rear panel ADV SYNC.OUT (BNC connector)	VR40 (22L)			Terminate the ADV SYNC OUT terminal on the rear panel in 75 Ω , then connect it to an oscilloscope. Adjust VR40 so that the voltage becomes 4 Vp-p.
25	BLACK STRETCH confirmation	Rear panel VIDEO OUT (BNC connector)	VR11 (1Z)	RAMP	G E N LOCK B/W	Set the BLACK STRETCH [S11] on the video board front edge to ON. Connect VIDEO OUT to the waveform monitor. Rotate VR11 and confirm that the center of the sloping part moves left and right about the vicinity of 55IRE of the RAMP signal.
26	SC TRAP confirmation	Rear panel Y OUT (BNC connector)	S5 (3P)	SWEEP	Y/C358	Connect Y OUT to the waveform monitor. Set S5 to ON and confirm that the waveform shown in the figure at left is obtained.
27	Confirmation of blanking	Rear panel VIDEO OUT (BNC connector)	JP15 (23Z)	EIA color bars	COMP	Connect VIDEO OUT to the waveform monitor. Set SET UP (front edge) to maximum. Set JP15 to the OFF side and confirm that the setup level of 11H to 19H during the V blanking period rises. Next, set JP15 to the ON side and confirm that the setup level matches the pedestal level.
28	VTR shuttle mode adjustment (FF)	IC99-4	VR64 (21U) VR66 (22U) VR65 (21U) VR60 (22S)	EIA color bars	COMP	Set VR64 [REW SENSE] and VR65 [F.FSENSE] to the position shown in the figure at left. Using an oscilloscope, adjust VR66 so that the width of the IC99-4 TTL level positive pulse is 4.7 μ sec.

1.4.5 Regulator Circuit

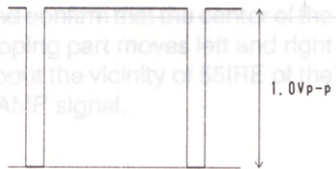
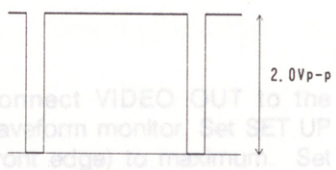
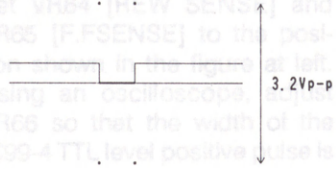
(Note) In the following adjustment procedure, test point and adjusting VRs are on the regulator board, unless otherwise specified.

No.	Item	TP	Adjustment point	Mode	Adjustment and check
1	+5V Adjustment	TP401	R406		1. Adjust R406 so that the voltage is within 5 ± 0.15 V.
2	−5V Adjustment	TP403	R414		1. Adjust R414 so that the voltage is within -5 ± 0.15 V.

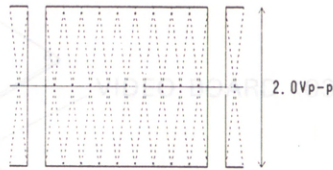
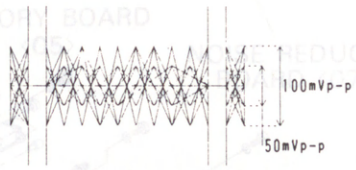
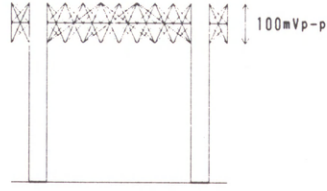
5	Adjustment of the A/D converter	TP302 TP307 TP312	R305 R309 R362 R366	Mod. Bar Y/C358	1. Connect an oscilloscope to TP306 and TP302, and measure the difference between two levels. 2. Output level adjustment to minimize residual chroma component. 3. Make the same measurement with TP307 and TP312, and adjust R362 and R366 in the same manner.
2	Output level adjustment	TP303 Y/C358	R318	Mod. Bar Y/C358	1. Connect an oscilloscope to TP303. Adjust R318 so that the output level is within 2.0 ± 0.06 V-p. Note: When the Mod. Bar signal is input, the composite side Y that is taken from the generator is input to the Y side of Y/C358.
3	NR position 2 limiter adjustment	TP308 R352	R373 R383	Mod. Bar Y/C358 SW5:OFF NR SW:ON Y NR SW:1	1. Connect an oscilloscope to TP303. Adjust R373 and R383 to minimize the residual chroma component. 2. Turn on SW5 and turn off the NR SW after the adjustment.

1.4.6 Noise Reducer Circuit

Note) In the following adjustment procedure, test points and adjusting VRs are on the NR board, unless otherwise specified.

No.	Item	TP	Adjustment point	Mode	Adjustment and check
1	Input level adjustment	TP301 TP306 TP311	R201 R217 R233	100%White Y/C358	<p>1. Connect an oscilloscope to each test point. Adjust each adjusting VR so that the input level is within 1.0 ± 0.03 Vp-p.</p> 
2	Output level adjustment	TP303	R318	100%White Y/C358	<p>1. Connect an oscilloscope to TP303. Adjust R318 so that the output level is within 2.0 ± 0.06 Vp-p.</p> 
3	NR position 2 limiter adjustment	TP308	R352	100%White Y/C358 SW4:OFF NR SW:ON Y NR SW:2	<p>1. Connect an oscilloscope to TP308. Adjust R352 so that the voltage level is within 3.2 ± 0.1 Vp-p.</p> <p>2. Turn on SW4 and turn off the NR SW after the adjustment.</p> 

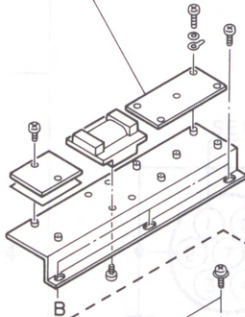
Note) In the following adjustment procedure, test points and adjusting VRs are on the NR board, unless otherwise specified.

No.	Item	TP	Adjustment point	Mode	Adjustment and check
4	ALU input level adjustment Note) When the Mod. Bar signal is input, the composite video of the signal generator is input to the Y side of Y/C358 input.	TP307	R332	Mod. Bar Y/C358	1. Connect an oscilloscope to TP307. Adjust R332 so that the input level is within 2.0 ± 0.06 Vp-p. 
5	ALU phase adjustment Note) When the Mod. Bar signal is input, the composite video of the signal generator is input to the Y side of Y/C358.	TP302 TP307 TP312	R305 R309 R362 R366	Mod. Bar Y/C358	1. Connect an oscilloscope to TP308 and TP302, and measure the difference between two levels. 2. Adjust R305 and R309 to minimize the residual chroma component. 3. Make the same measurement with TP307 and TP 312, and adjust R362 and R366 in the same manner. 
6	NR position 1 limiter adjustment	TP303	R373 R383	Mod. Bar Y/C358 SW5:OFF NR SW:ON Y NR SW:1	1. Connect an oscilloscope to TP303. Adjust R373 and R383 to minimize the residual chroma component. 2. Turn on SW5 and turn off the NR SW after the adjustment. 

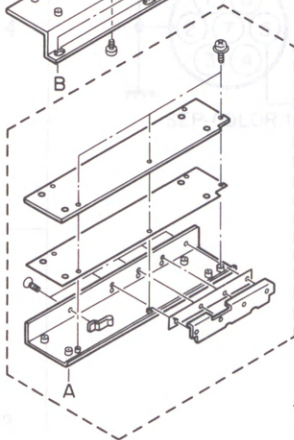
SECTION 2 DIAGRAMS AND CIRCUIT BOARDS

2.1 CIRCUIT BOARD LOCATIONS

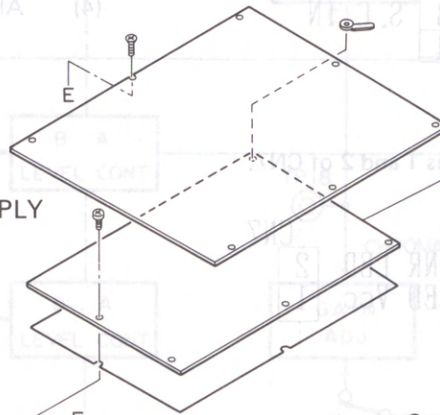
REGULATOR BOARD <01>



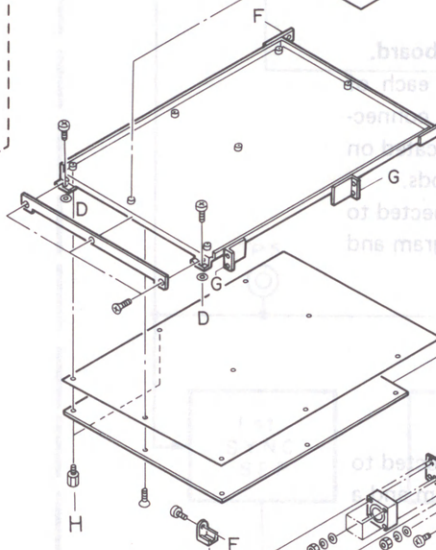
POWER SUPPLY
<02>



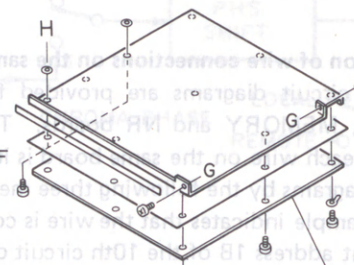
VIDEO BOARD <03>



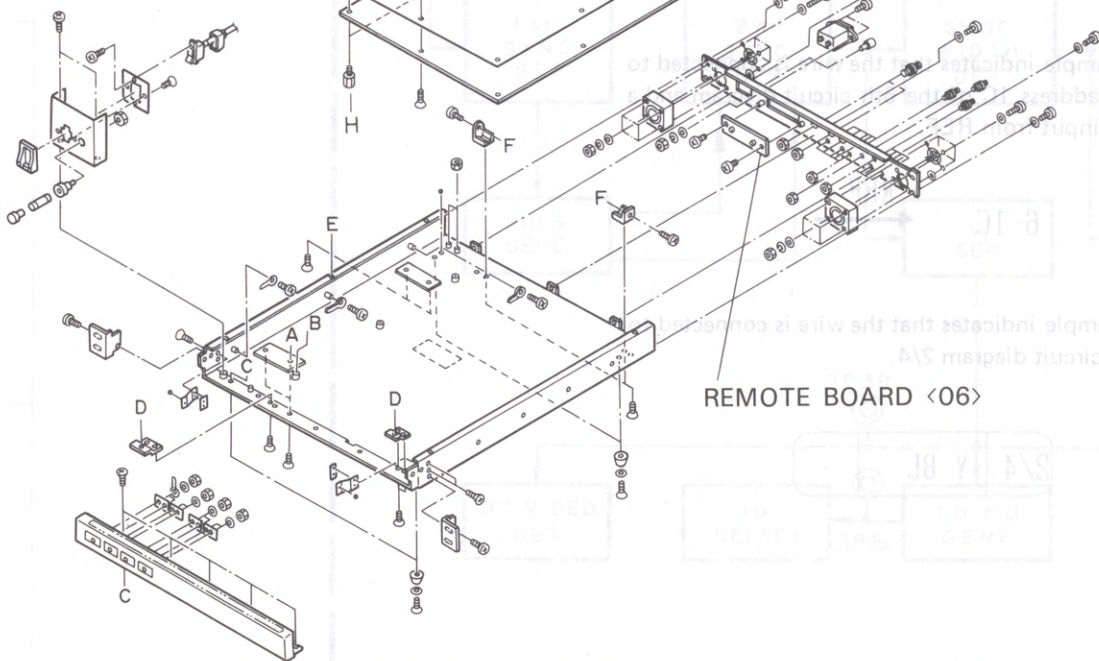
MEMORY BOARD
<05>



NOISE REDUCER
BOARD <07>



REMOTE BOARD <06>

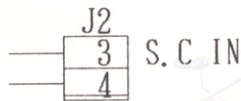


2.2 Precautions to be Taken with Circuit Diagrams

2.2.1 Connector indication

Connectors are indicated by the following two methods.

- (1) This example represents pins 2 and 3 of J2.



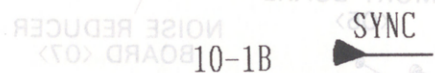
- (2) This example represents pins 1 and 2 of CN7.



2.2.2 Indication of wire connections on the same board.

Several circuit diagrams are provided for each of VIDEO, MEMORY and NR boards. The connection of each wire on the same board is indicated on these diagrams by the following three methods.

- (1) This example indicates that the wire is connected to SYNC at address 1B of the 10th circuit diagram and a signal is input from SYNC.



- (2) This example indicates that the wire is connected to REF at address 1C of the 6th circuit diagram and a signal is input from REF.



- (3) This example indicates that the wire is connected to YBL of circuit diagram 2/4.



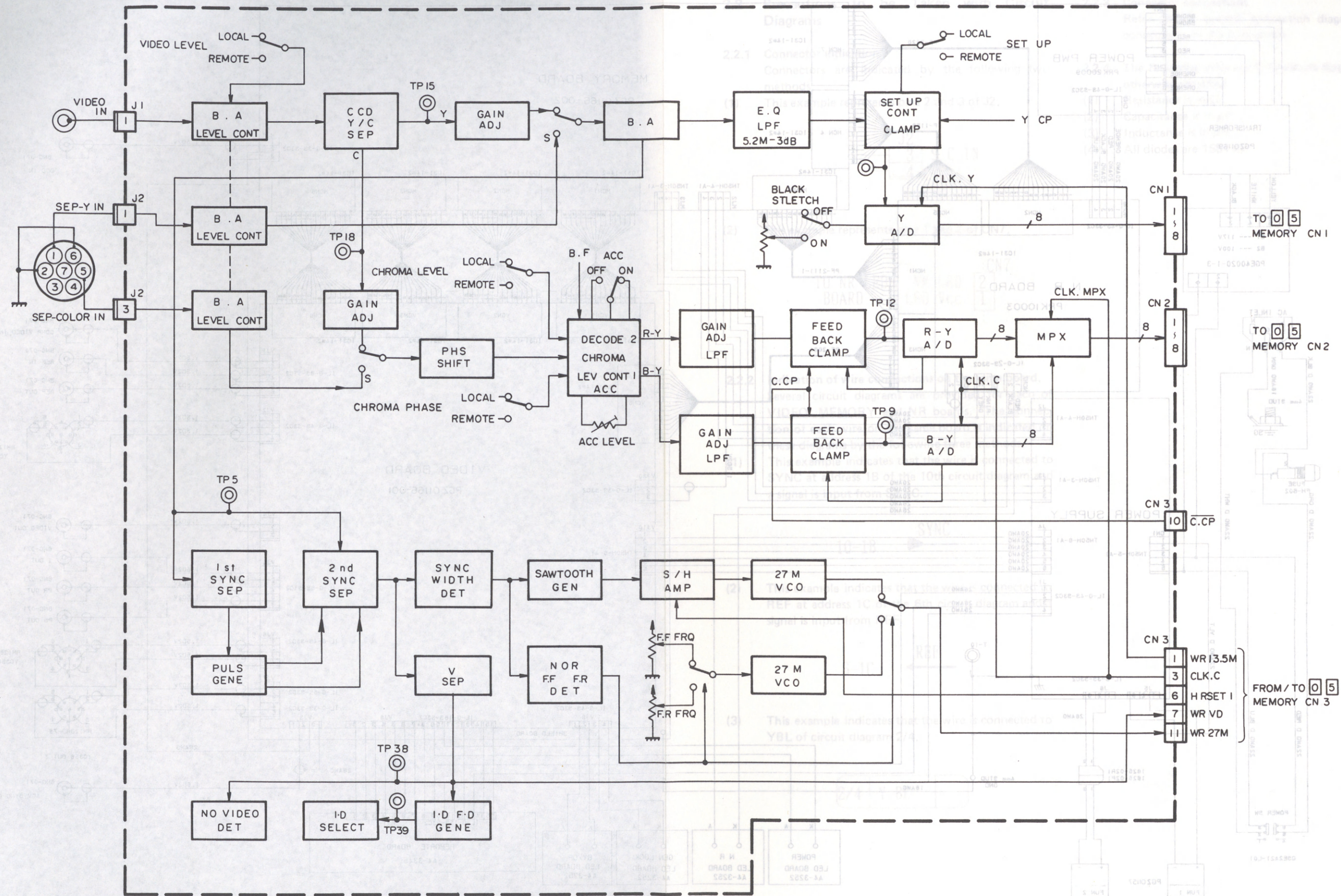
2.2.3 Connector connections

Refer to the general connection diagram for the connections of the connectors.

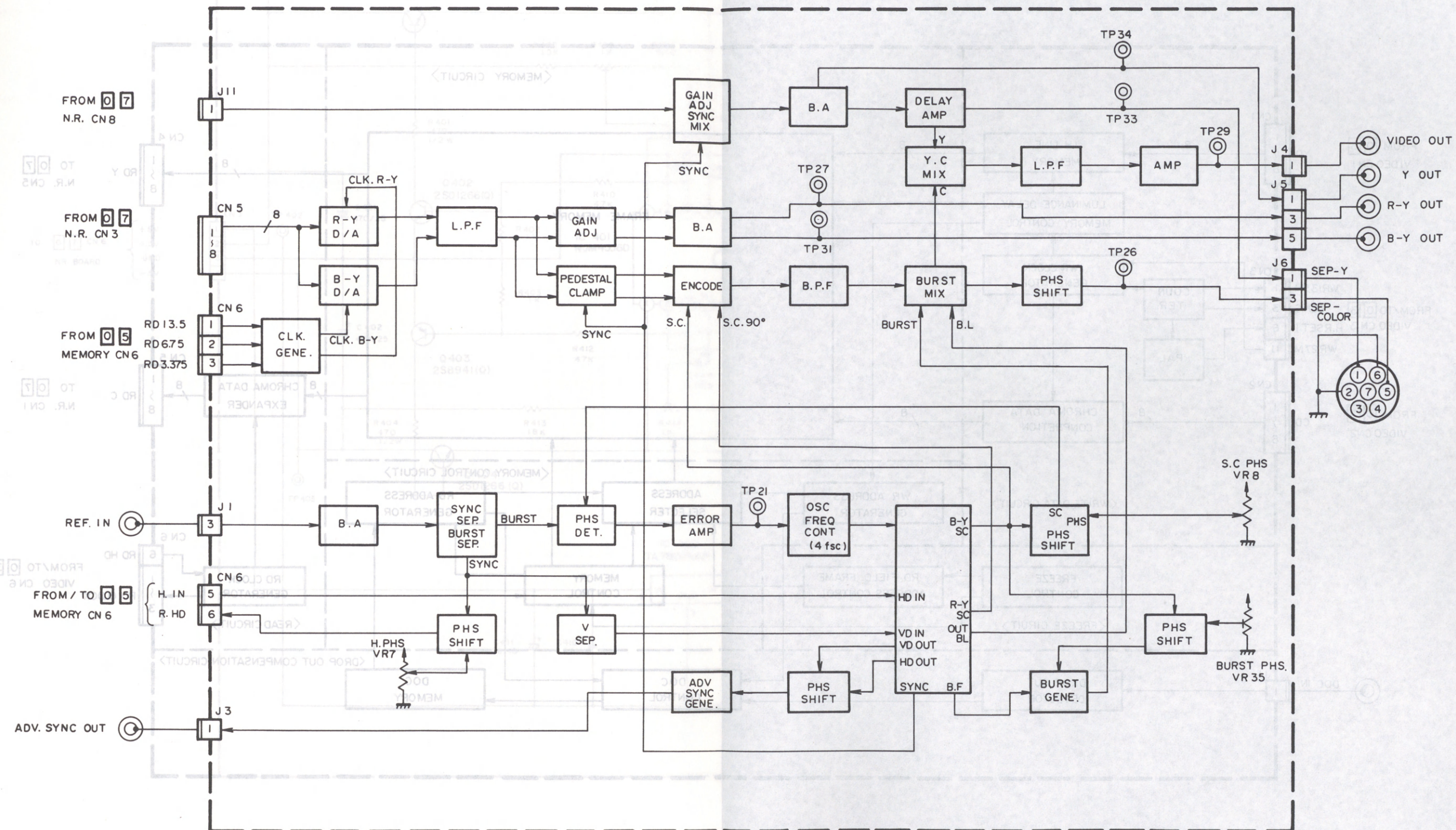
2.2.4 The following rules apply to circuit diagrams, unless otherwise specified.

- (1) Resistance is in Ω .
- (2) Capacitance is in μF .
- (3) Inductance is in μH .
- (4) All diodes are 1SS133.

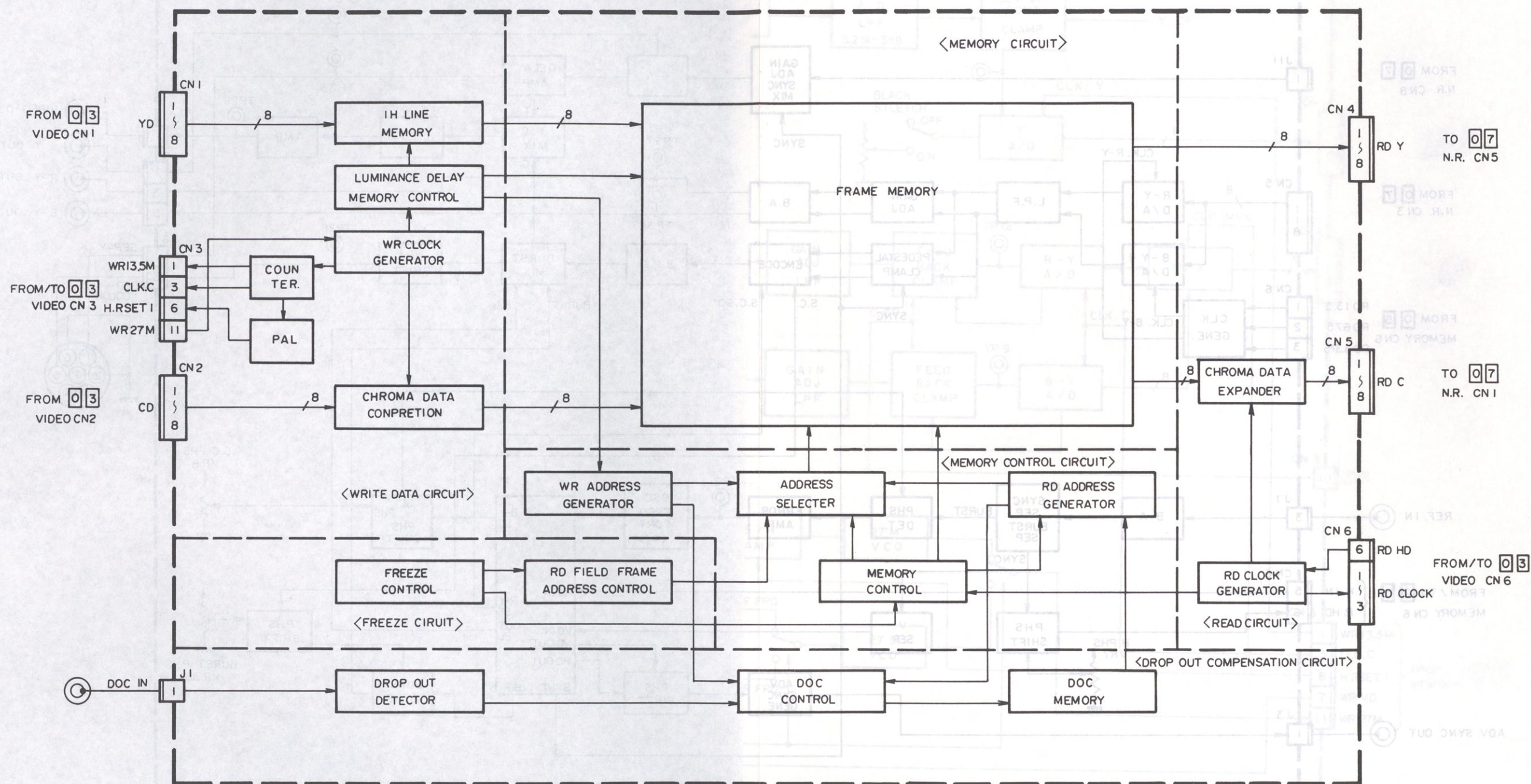
2.4 INPUT BLOCK DIAGRAM (VIDEO BOARD)



2.5.8 OUTPUT BLOCK DIAGRAM (VIDEO BOARD)



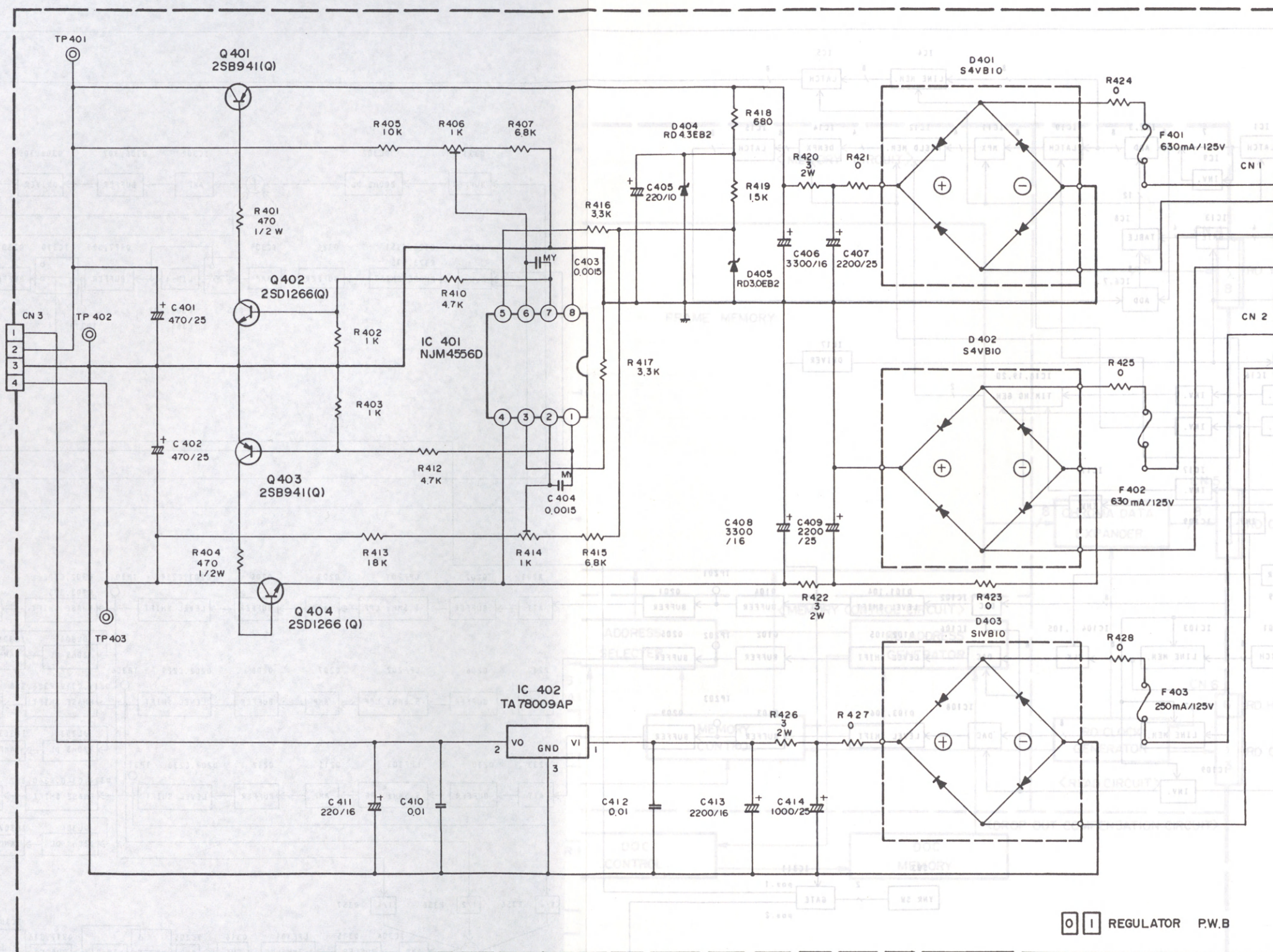
2.6 MEMORY BLOCK DIAGRAM



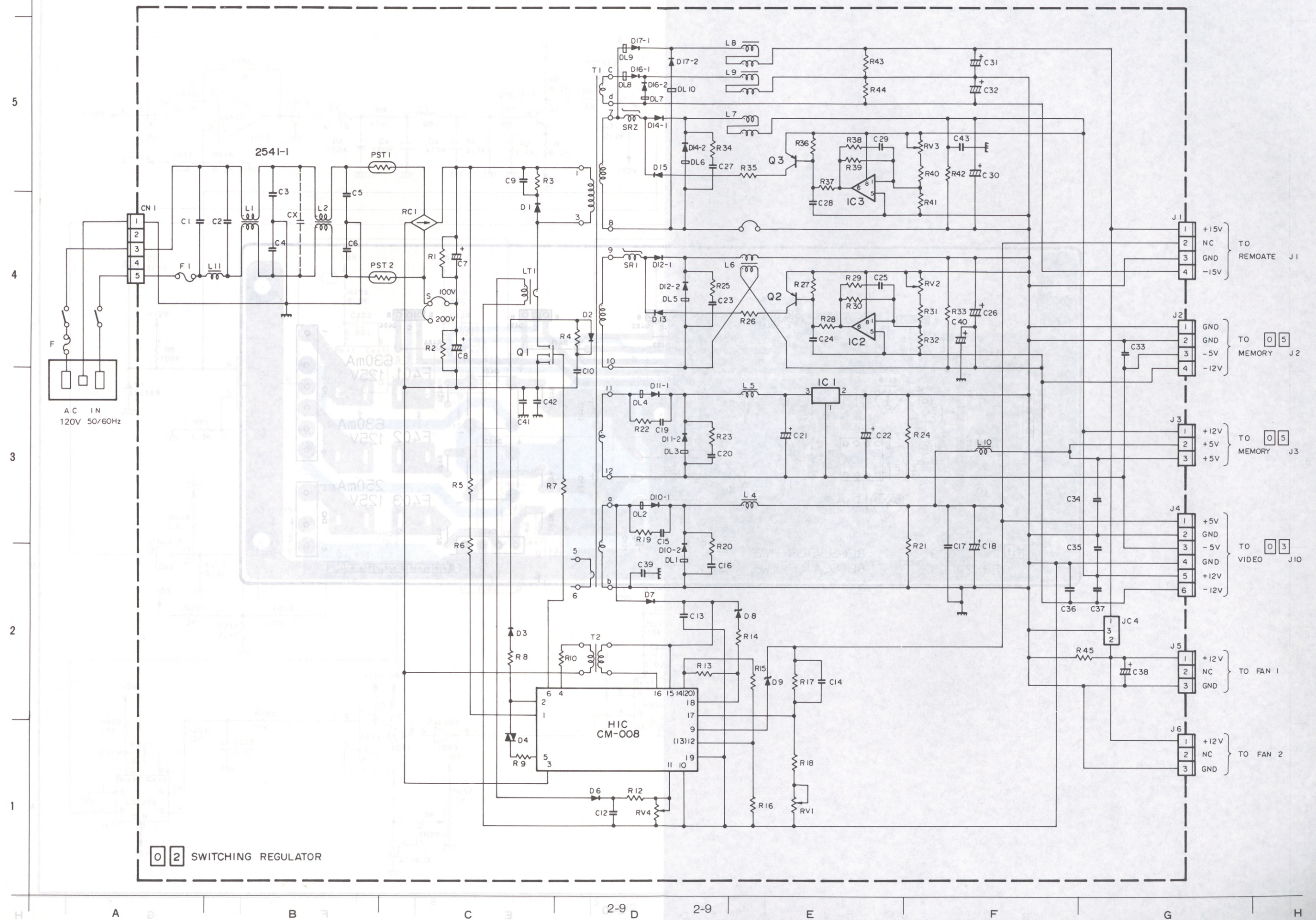
2.8 REGULATOR SCHEMATIC DIAGRAM

TO 0 7 CN 6
NR BOARD

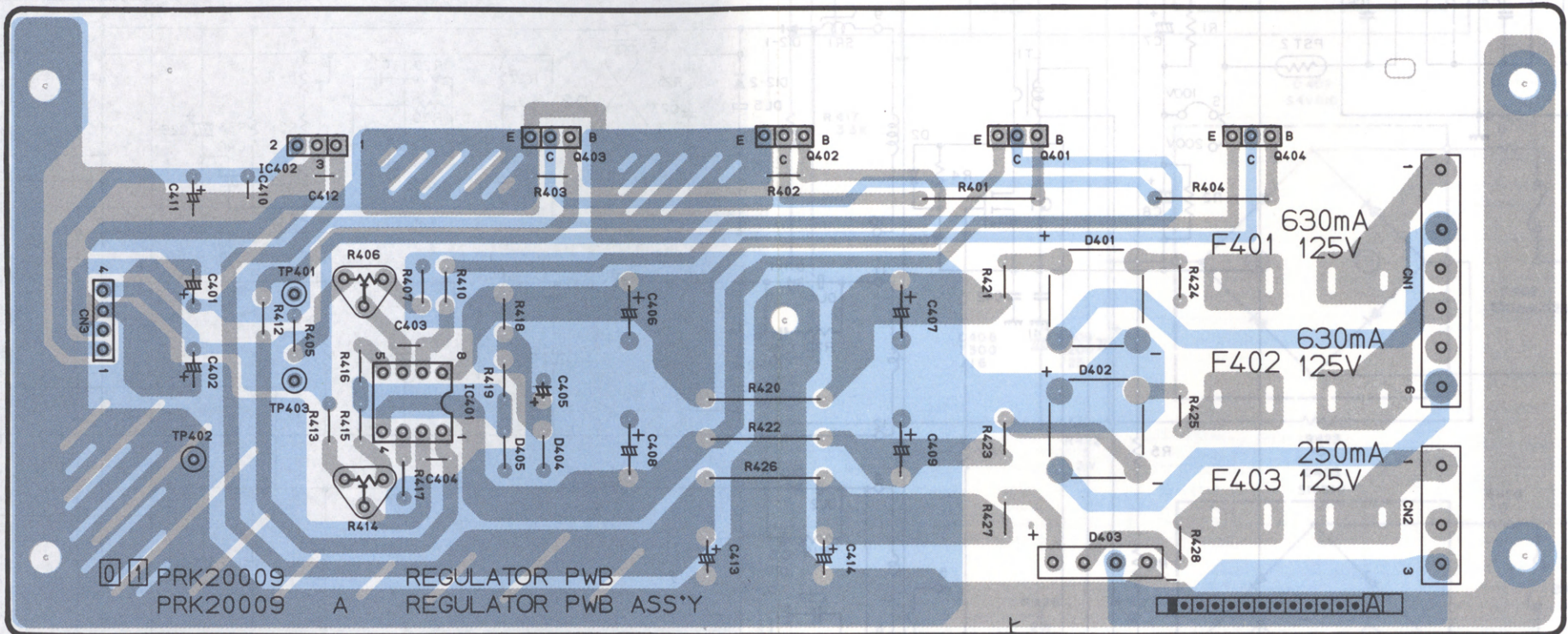
+9V
+5V
GND
-5V



0 1 REGULATOR P.W.B



2.10 REGULATOR CIRCUIT BOARD

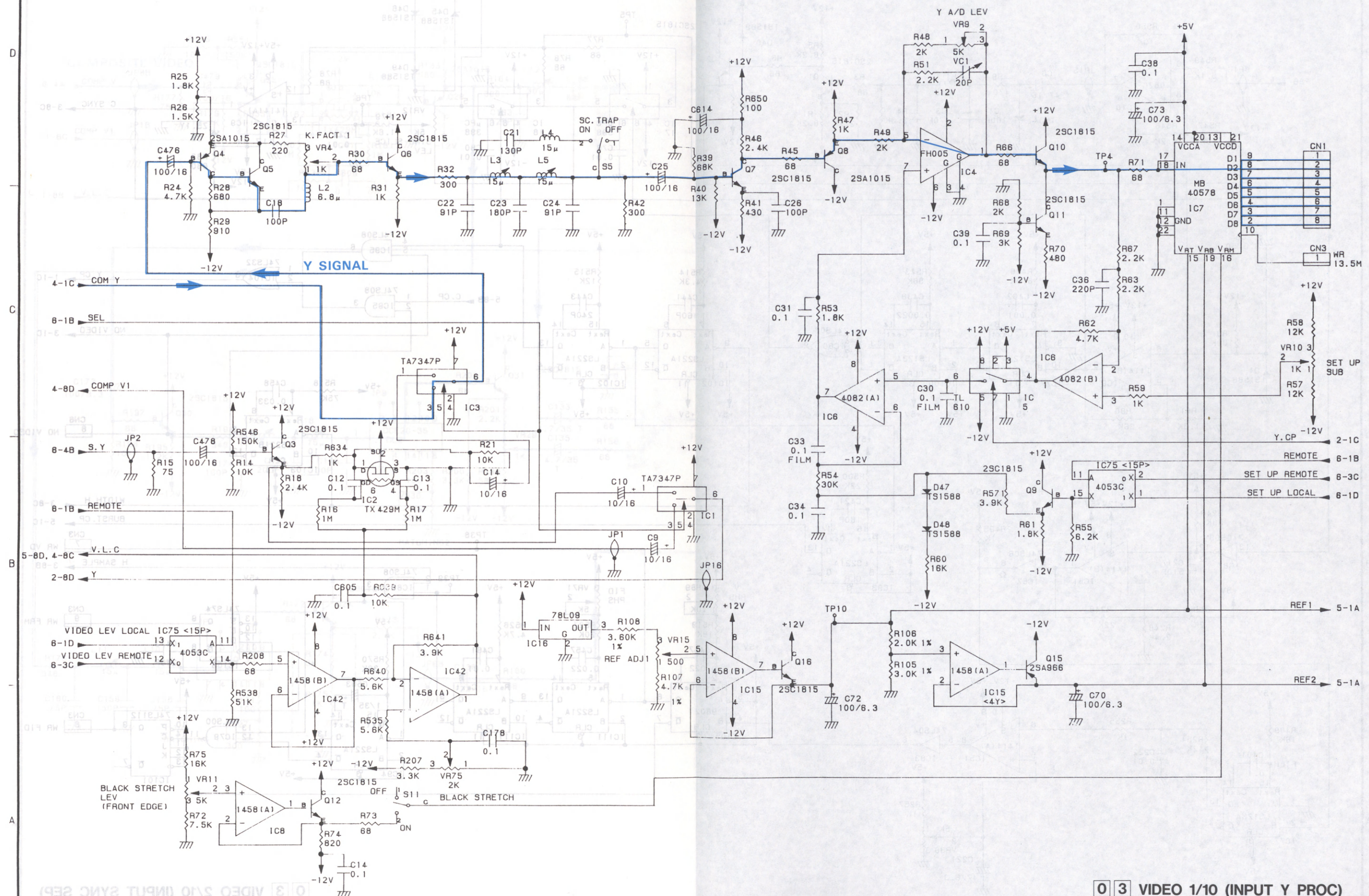


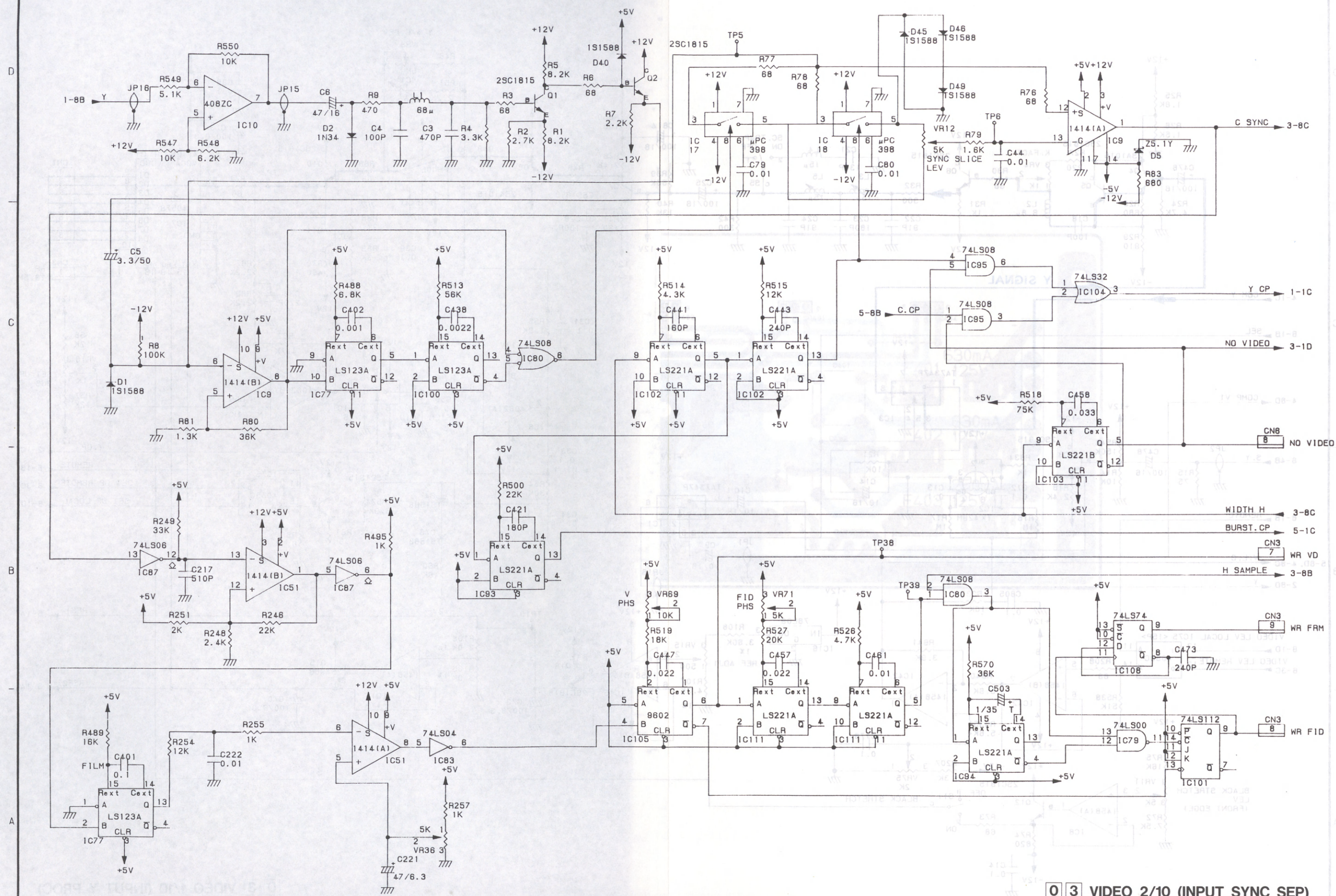
POWER SUPPLY SCHEMATIC DIAGRAM

REGULATOR PWB

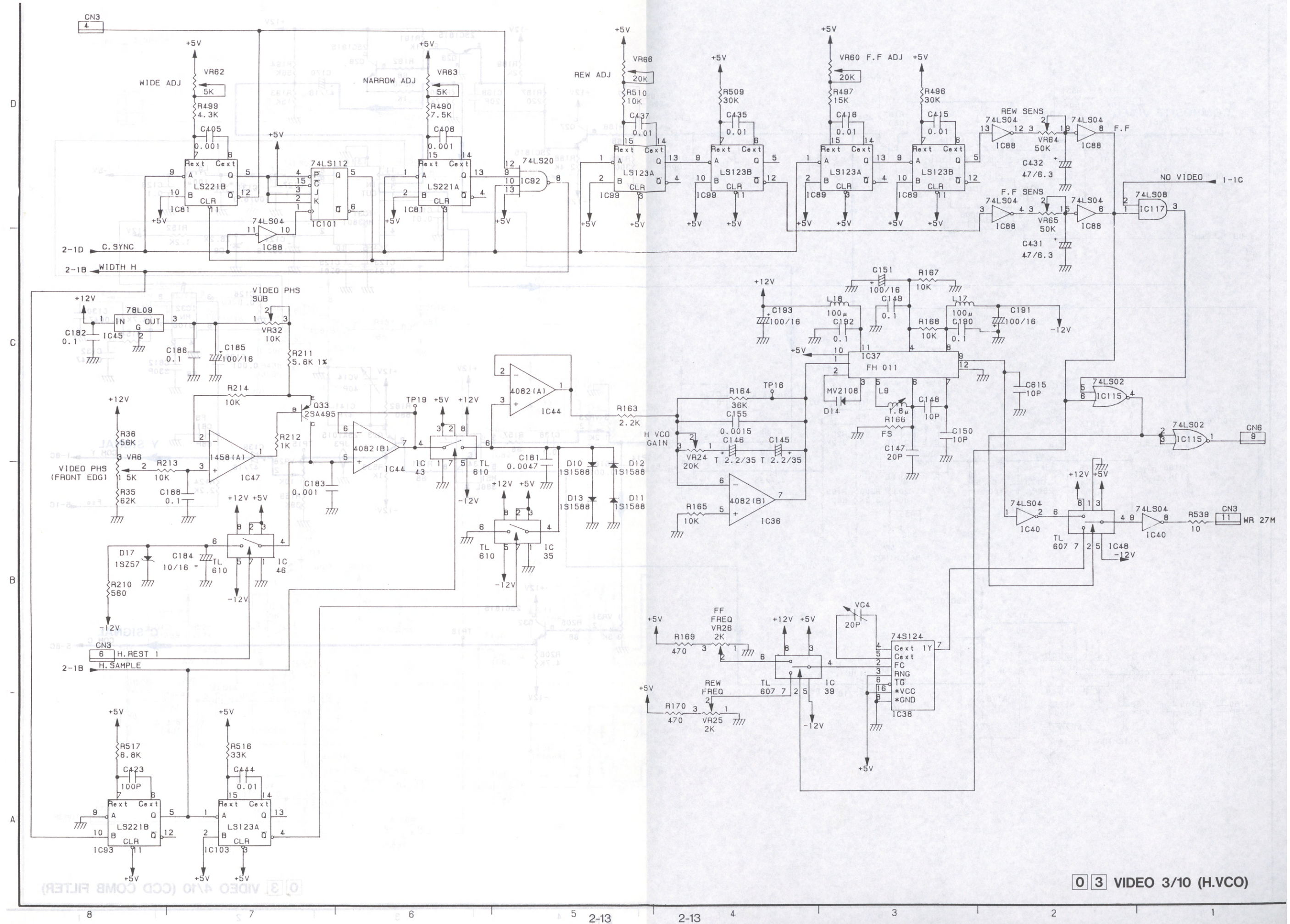
SWITCHING REGULATOR

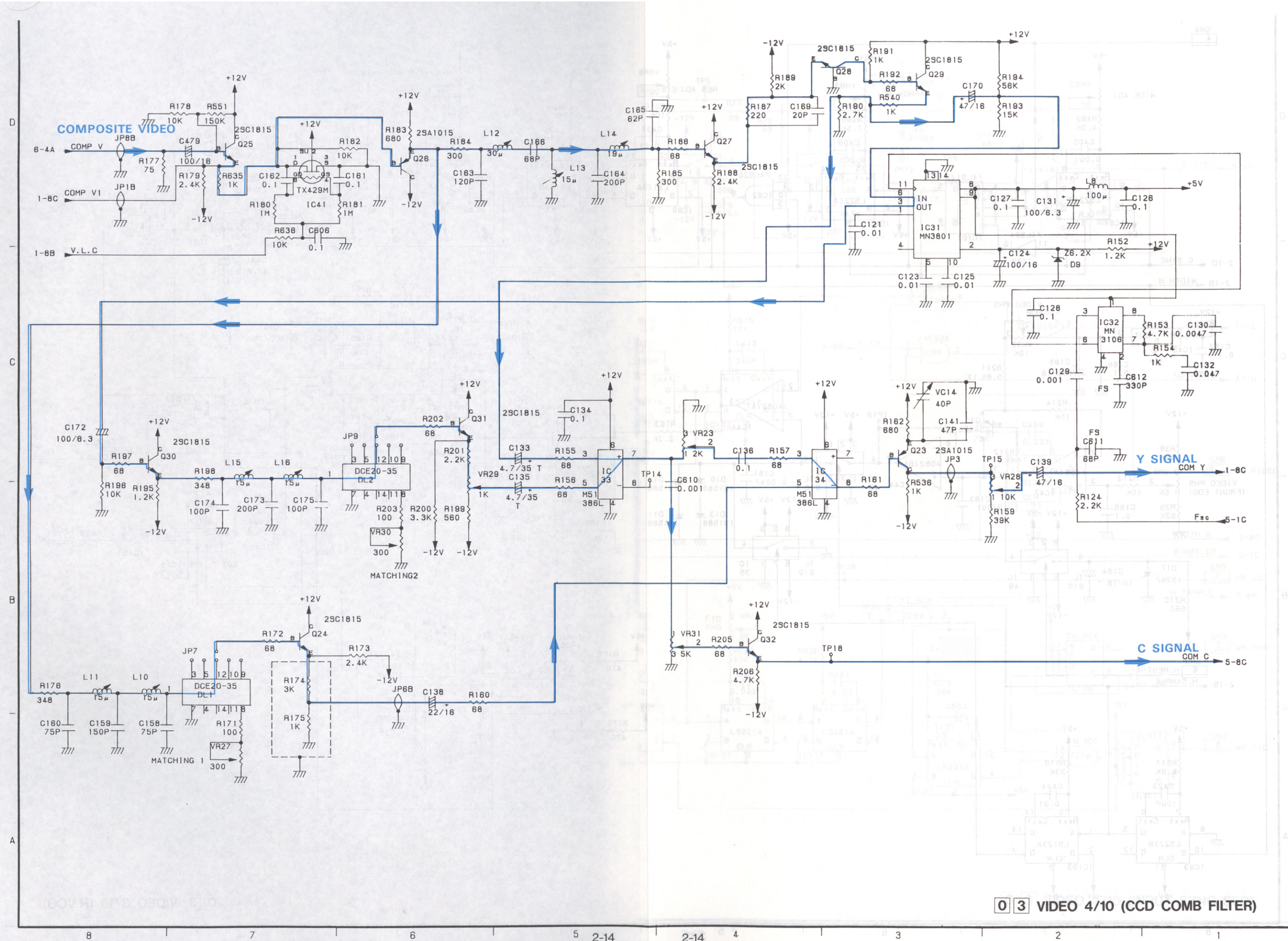
2.11 VIDEO SCHEMATIC DIAGRAM

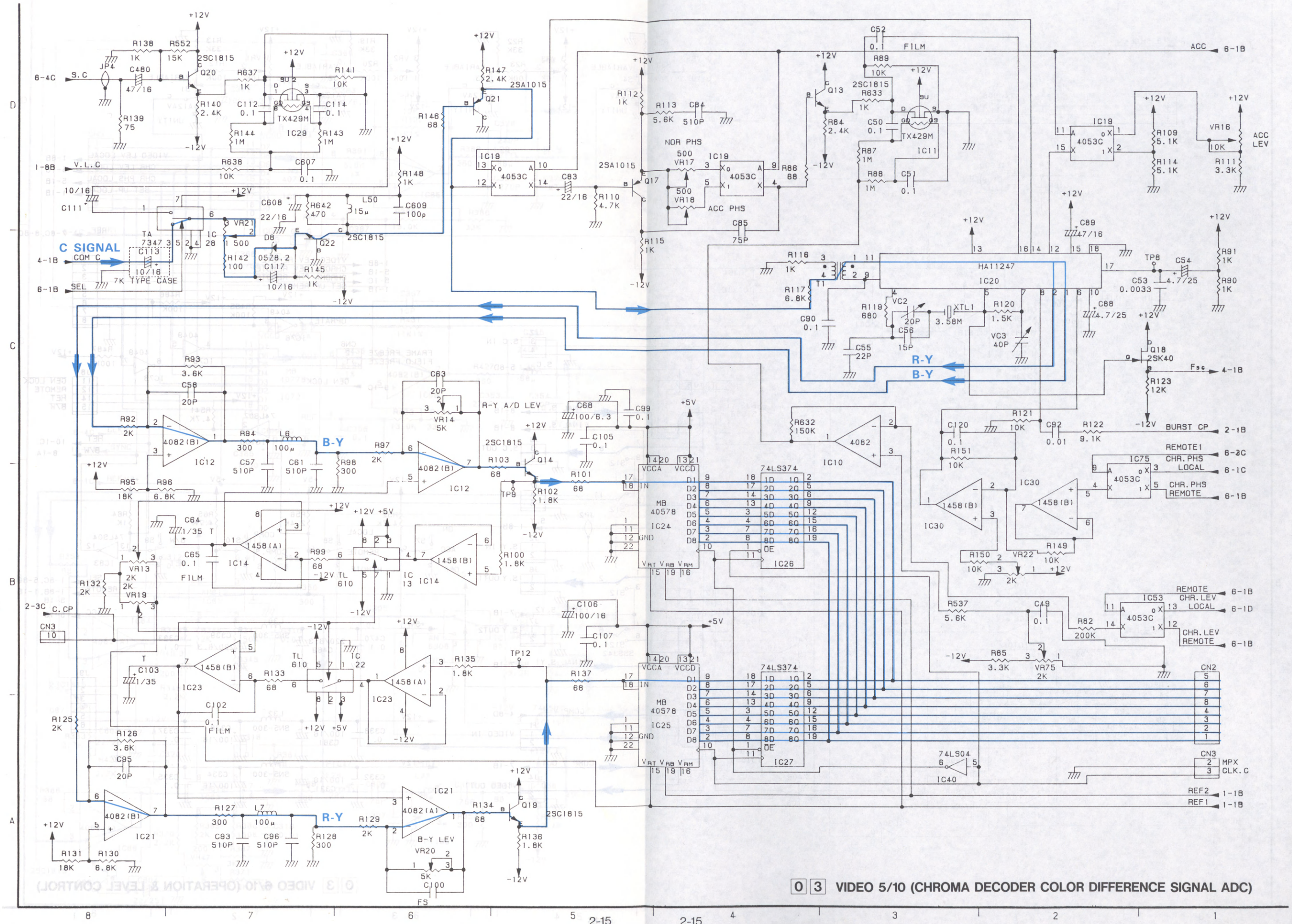




03 VIDEO 2/10 (INPUT SYNC SEP)







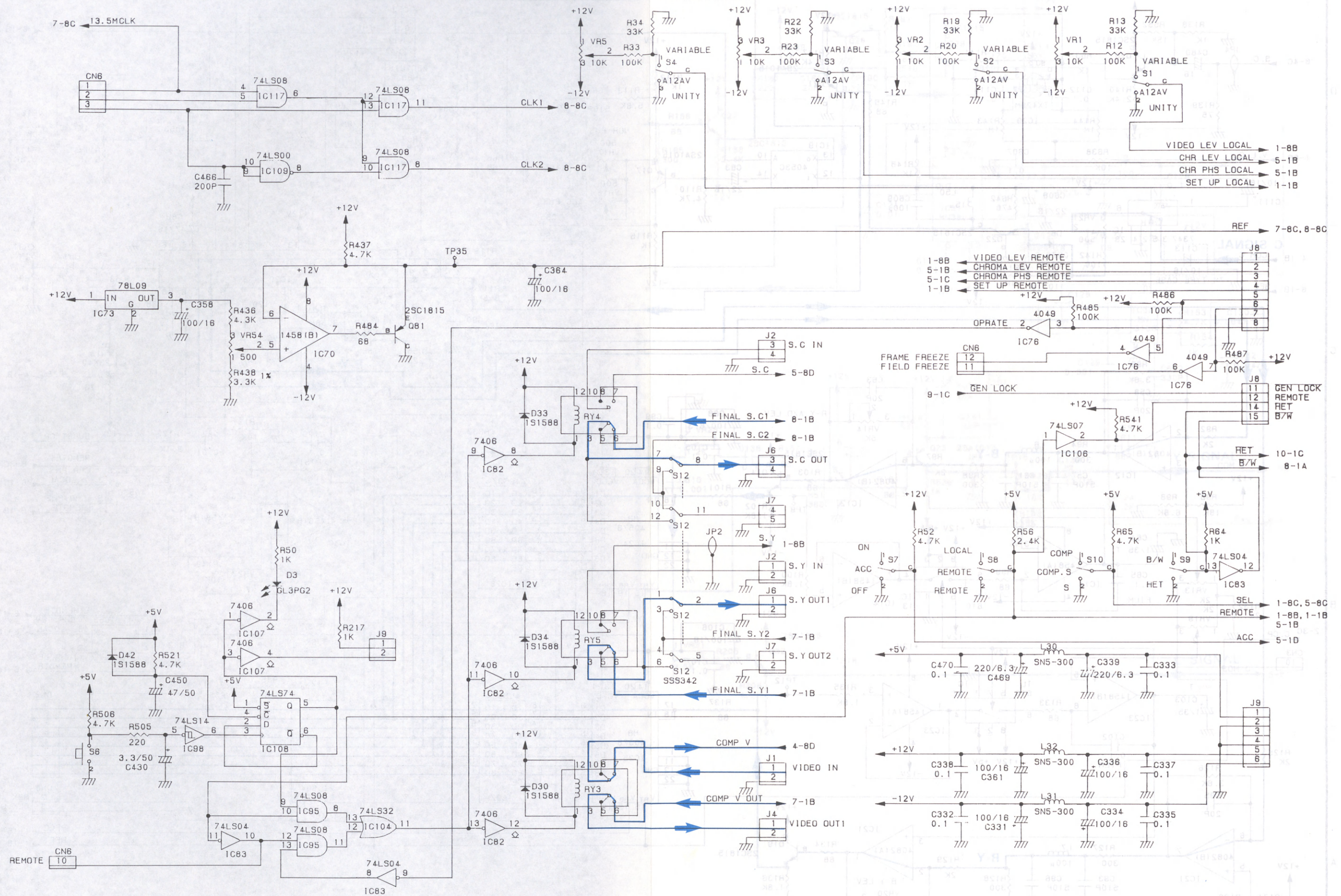
0 3 VIDEO 5/10 (CHROMA DECODER COLOR DIFFERENCE SIGNAL ADC)

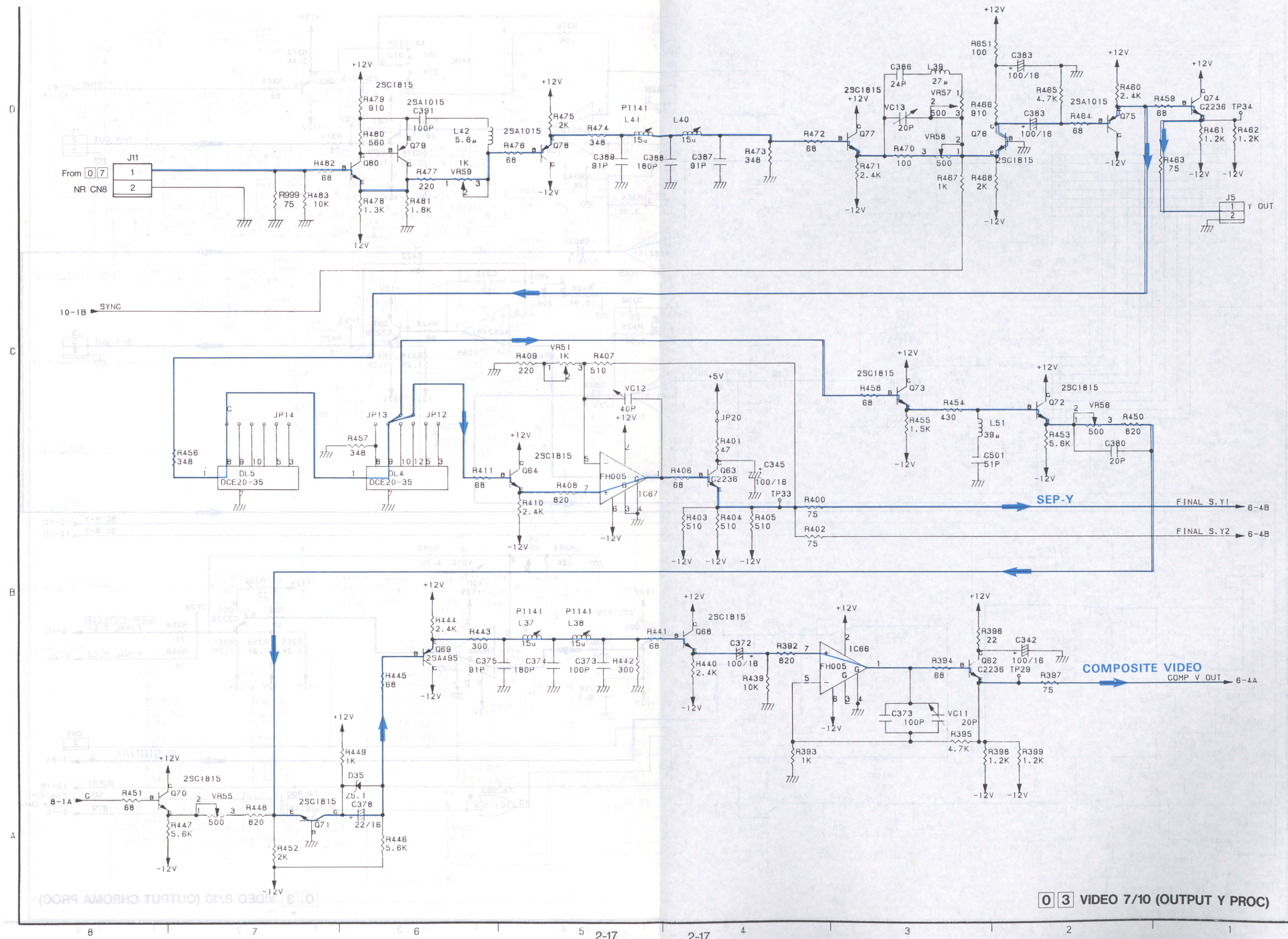
D

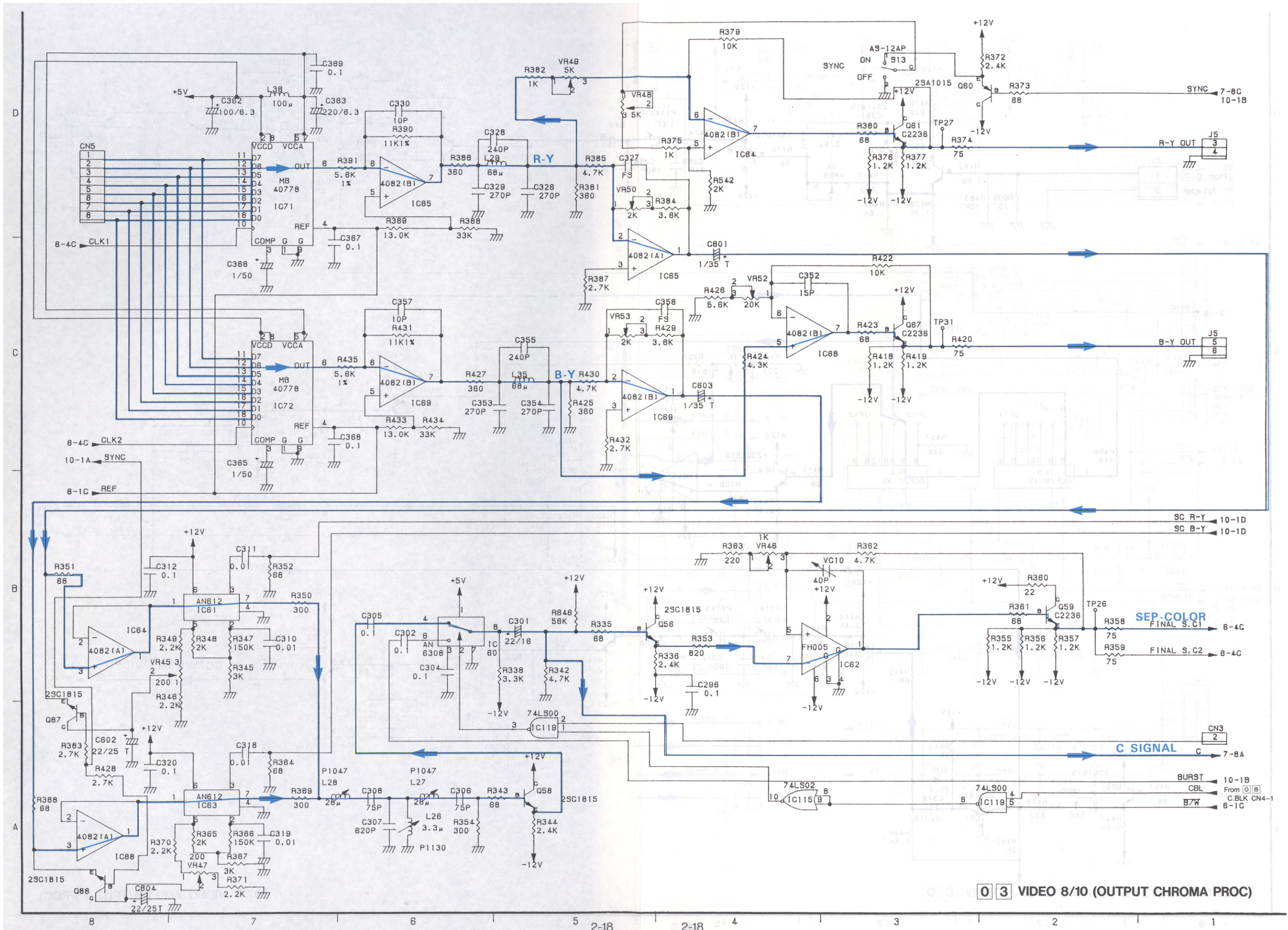
C

B

A

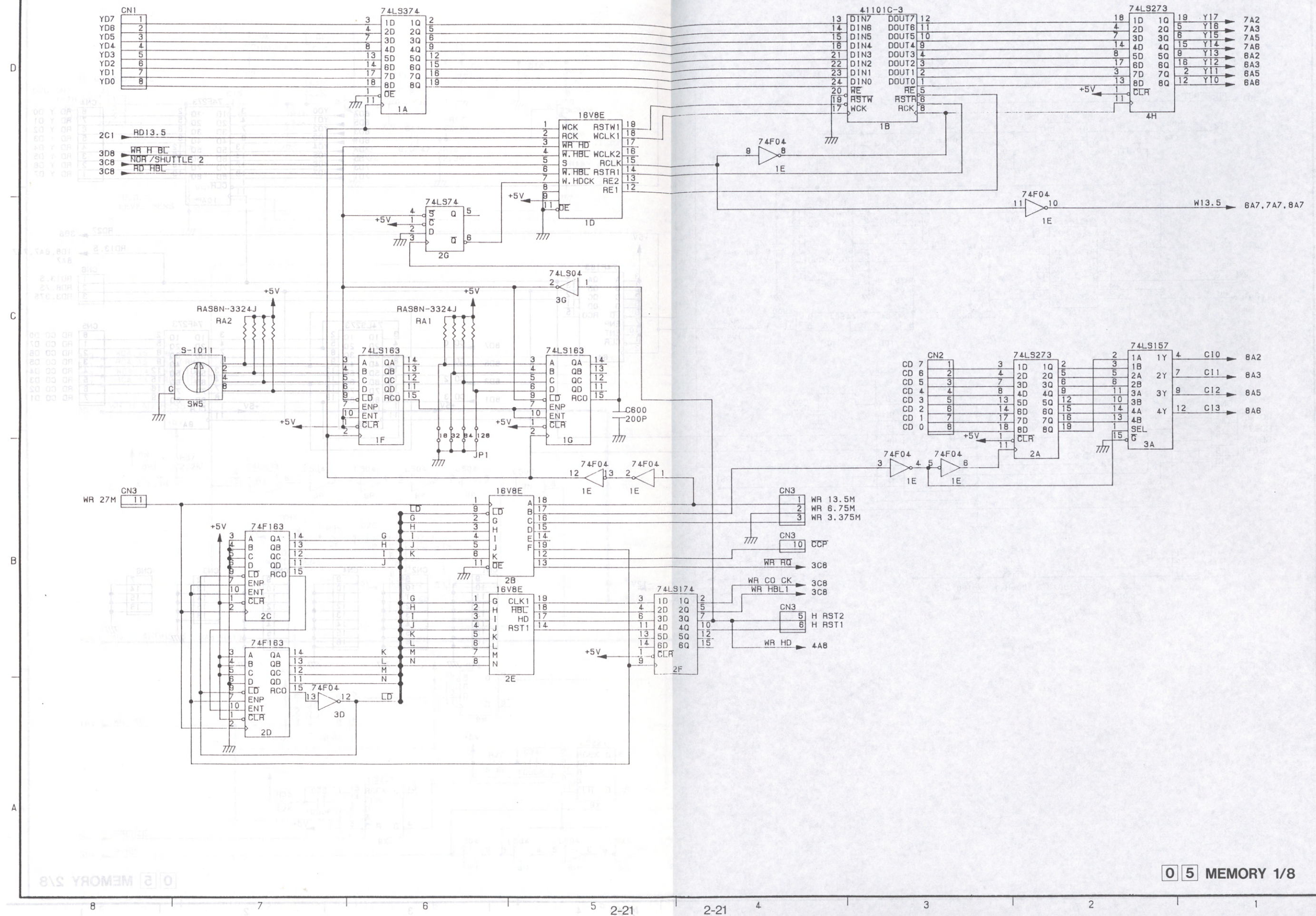




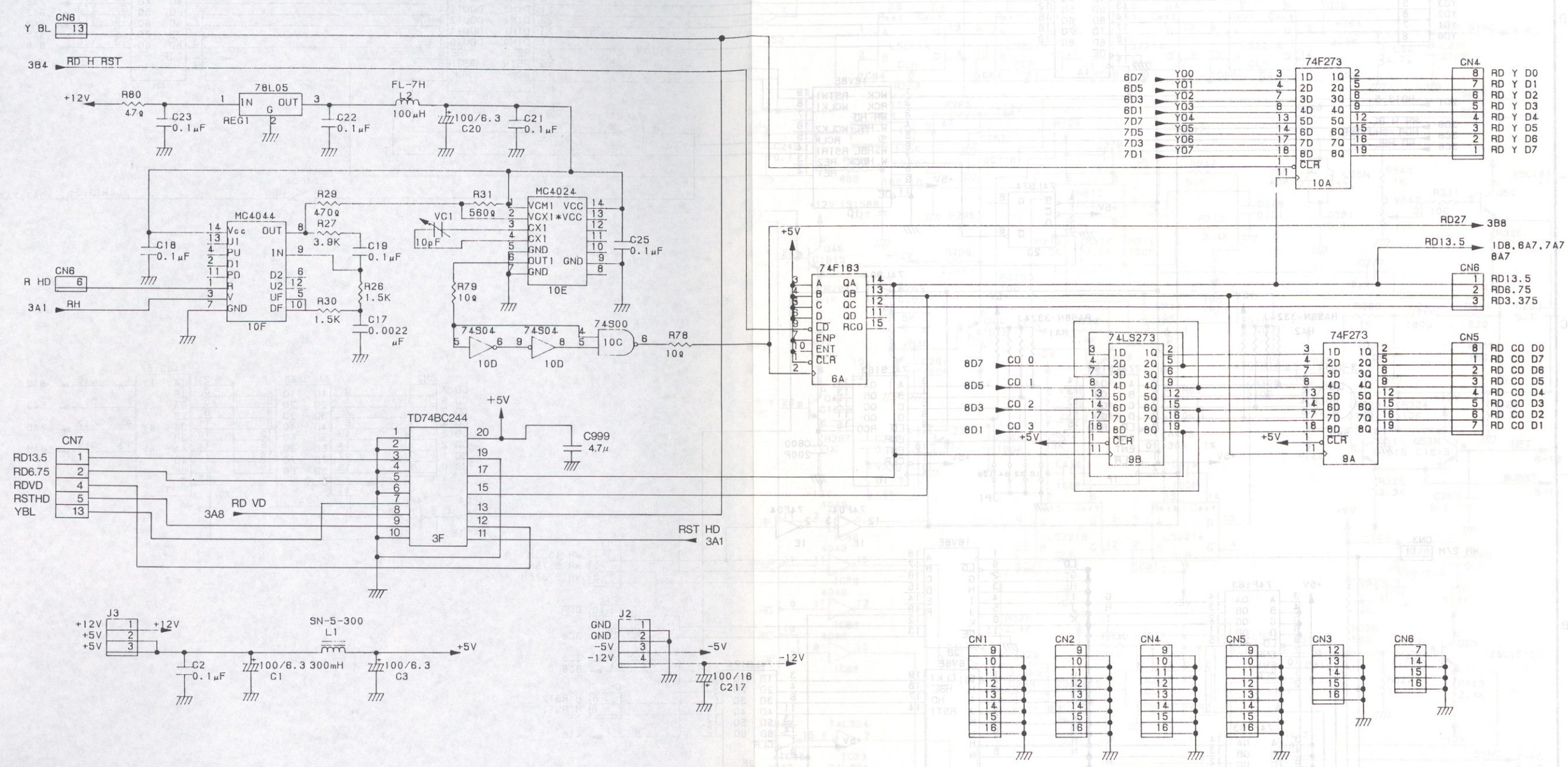


0 3 VIDEO 8/10 (OUTPUT CHROMA PROC)

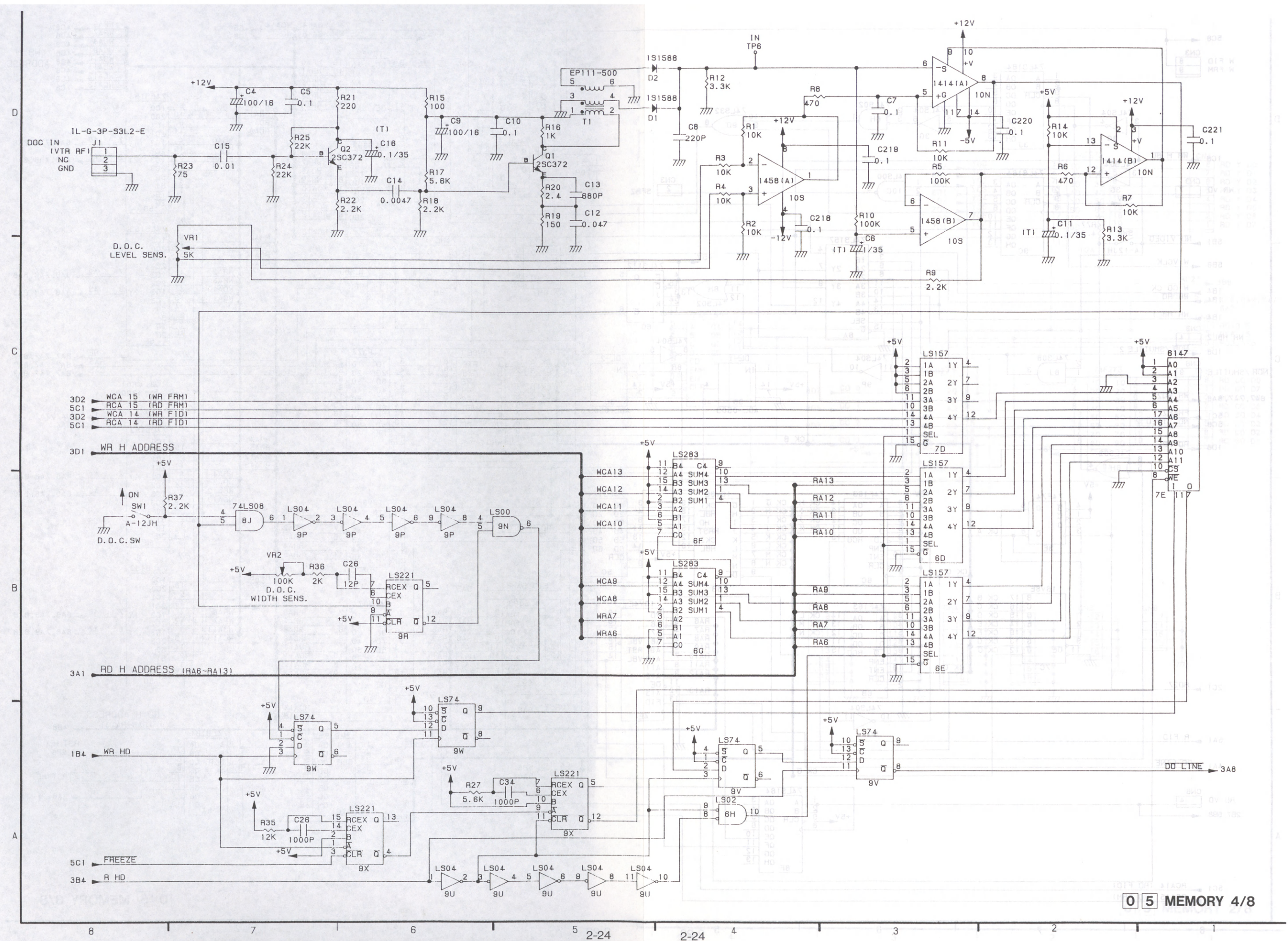
2.12 MEMORY SCHEMATIC DIAGRAM



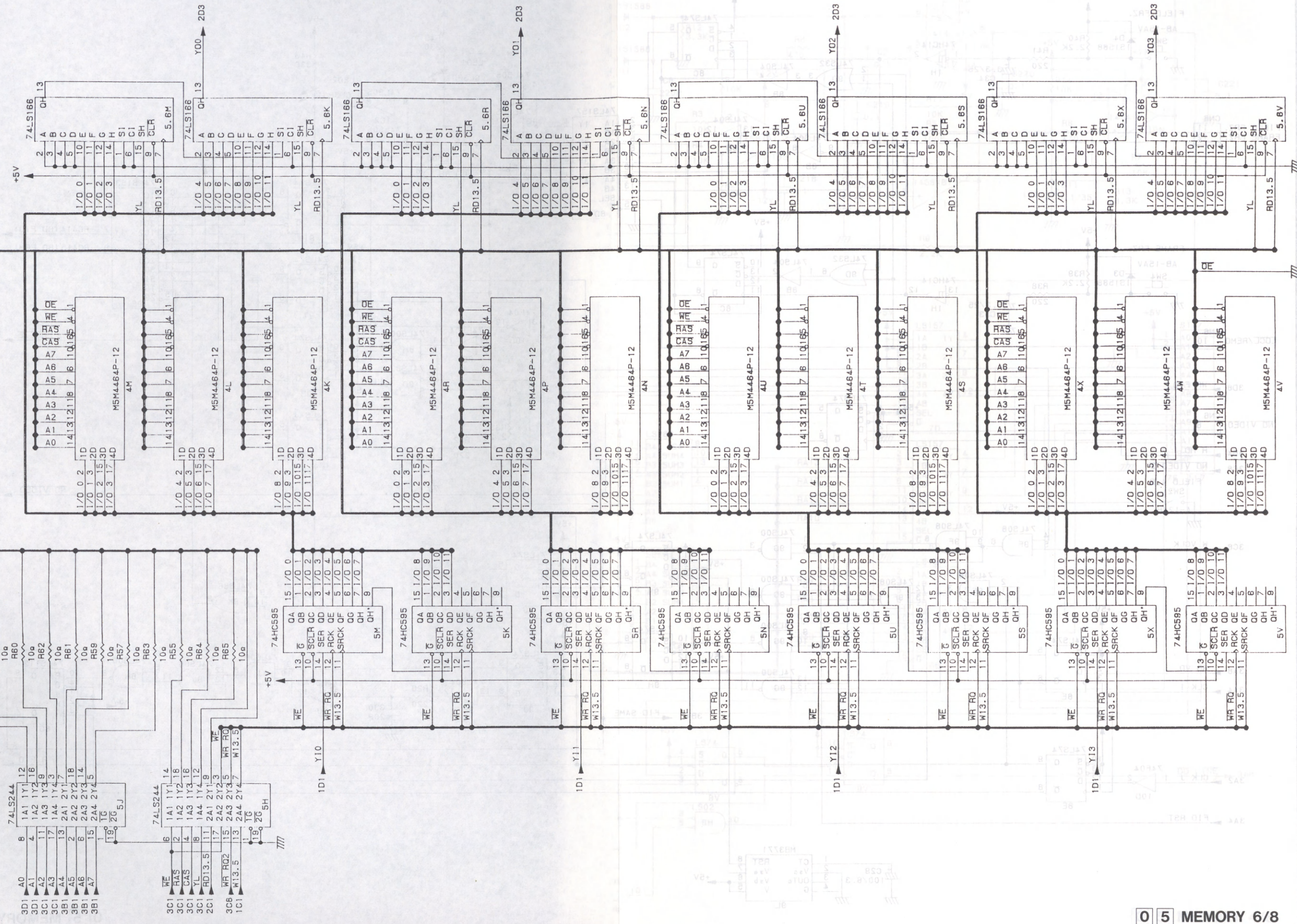
D
C
B
A

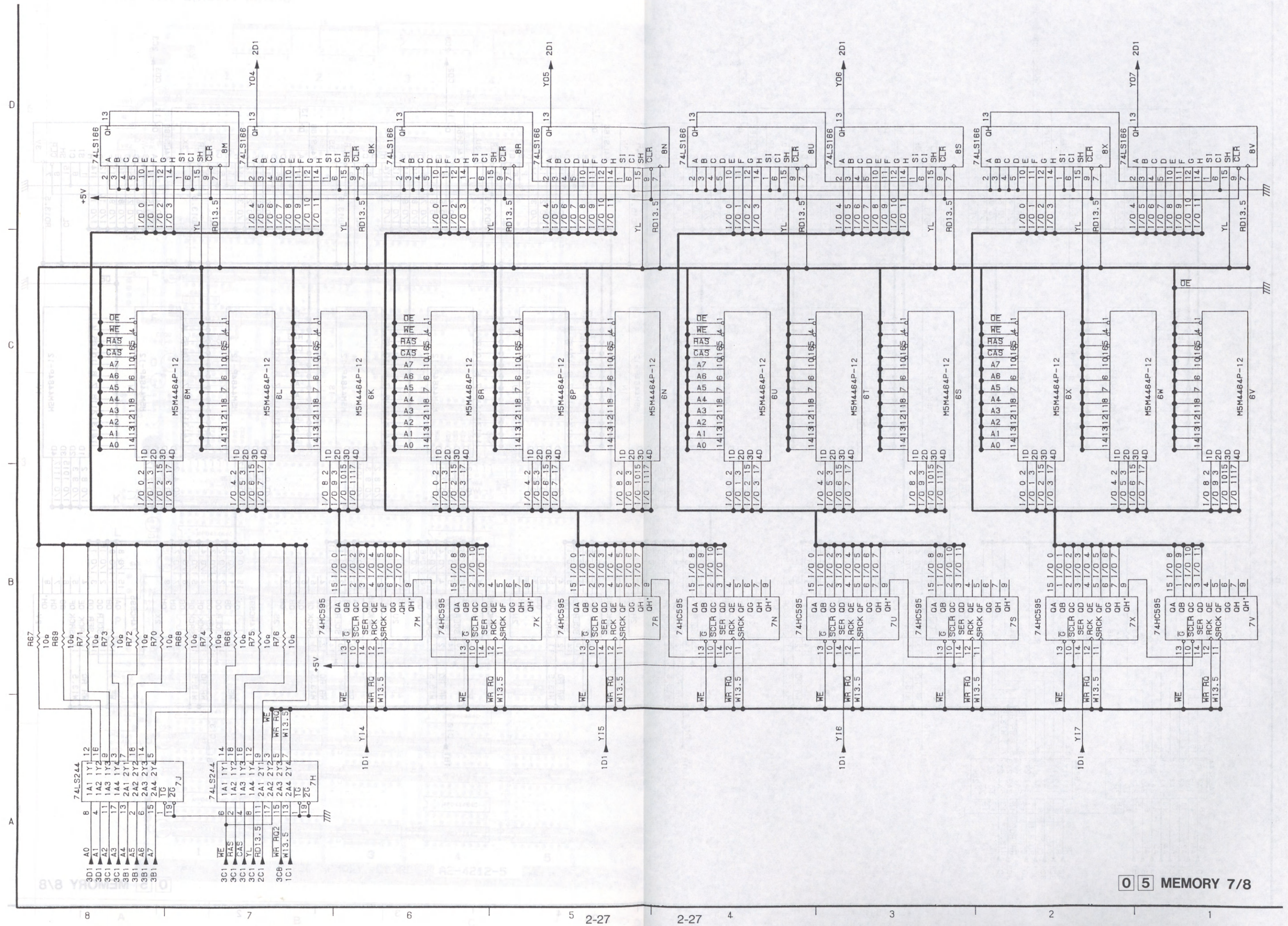


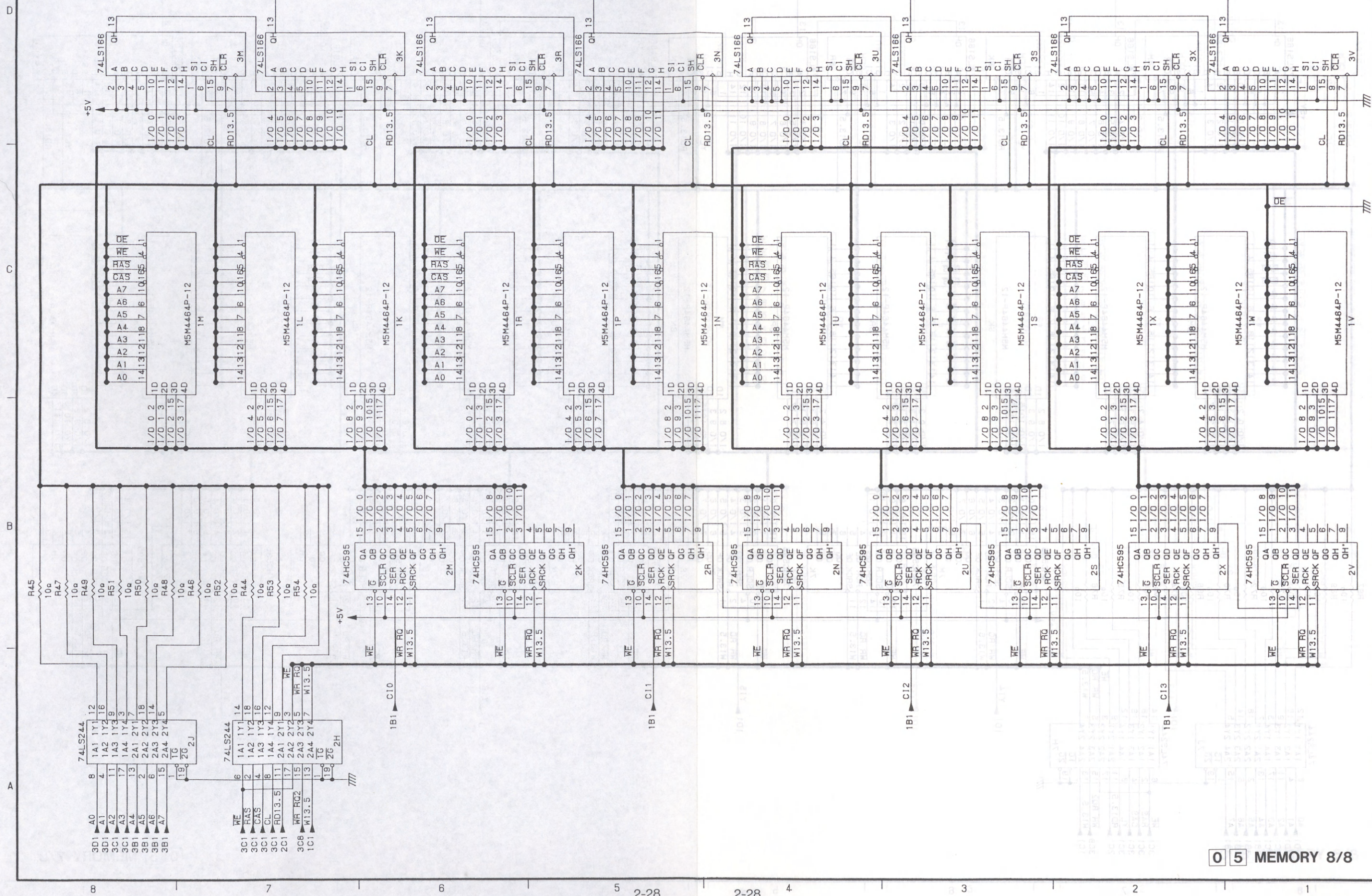




A B C D







5



B

C

2-29 D

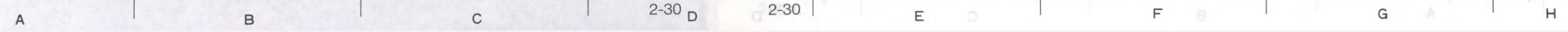
2-29

E

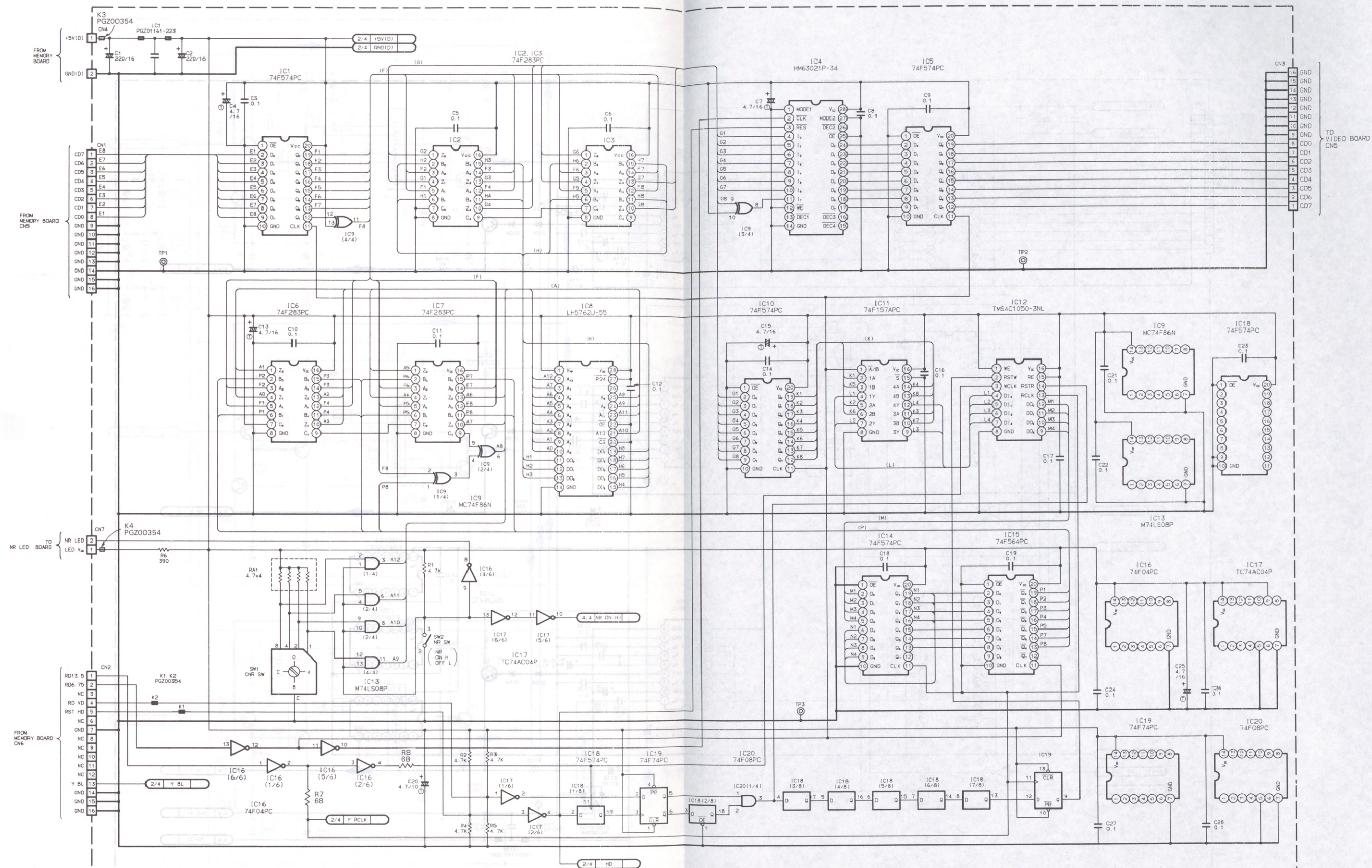
F

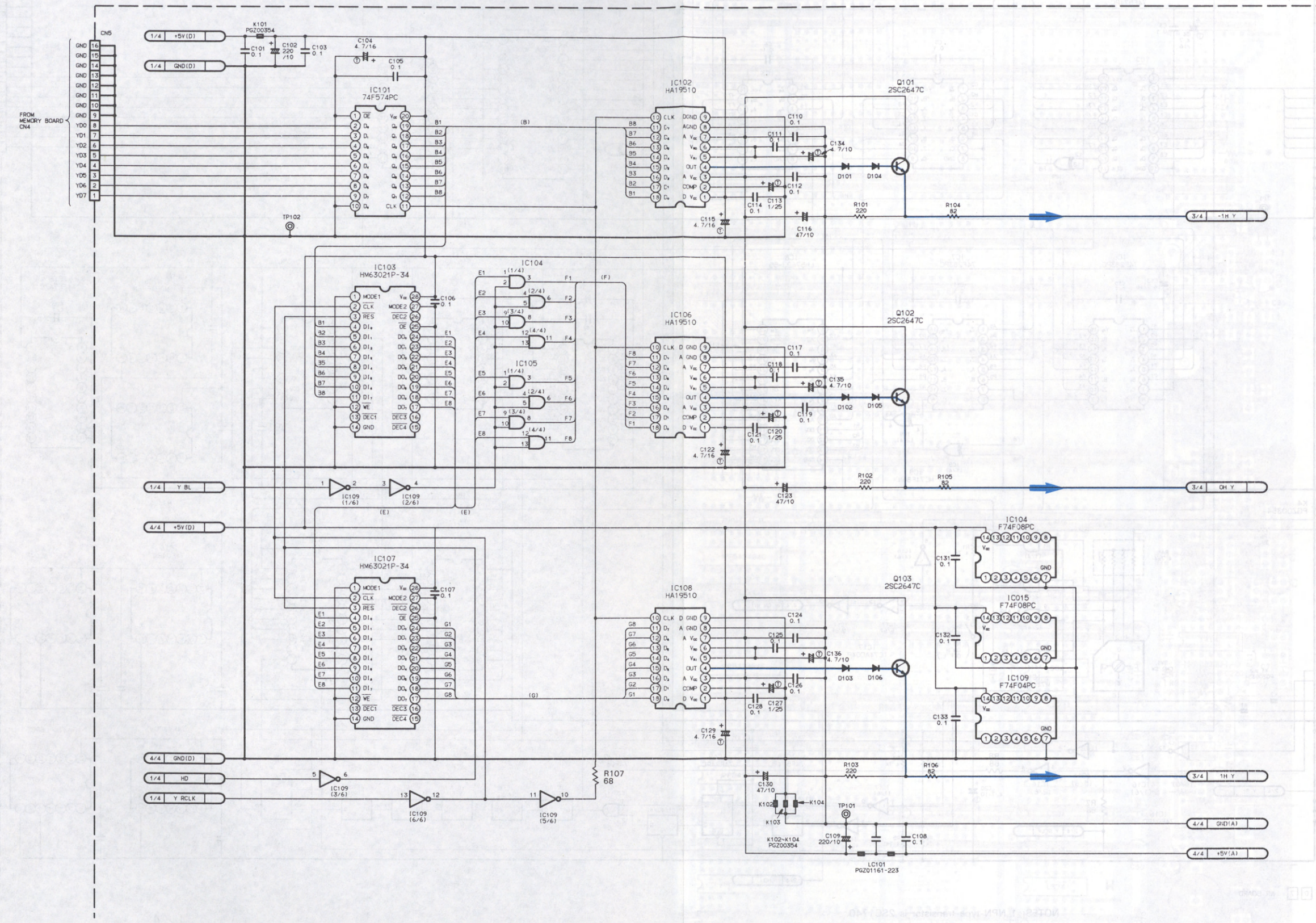
G

H

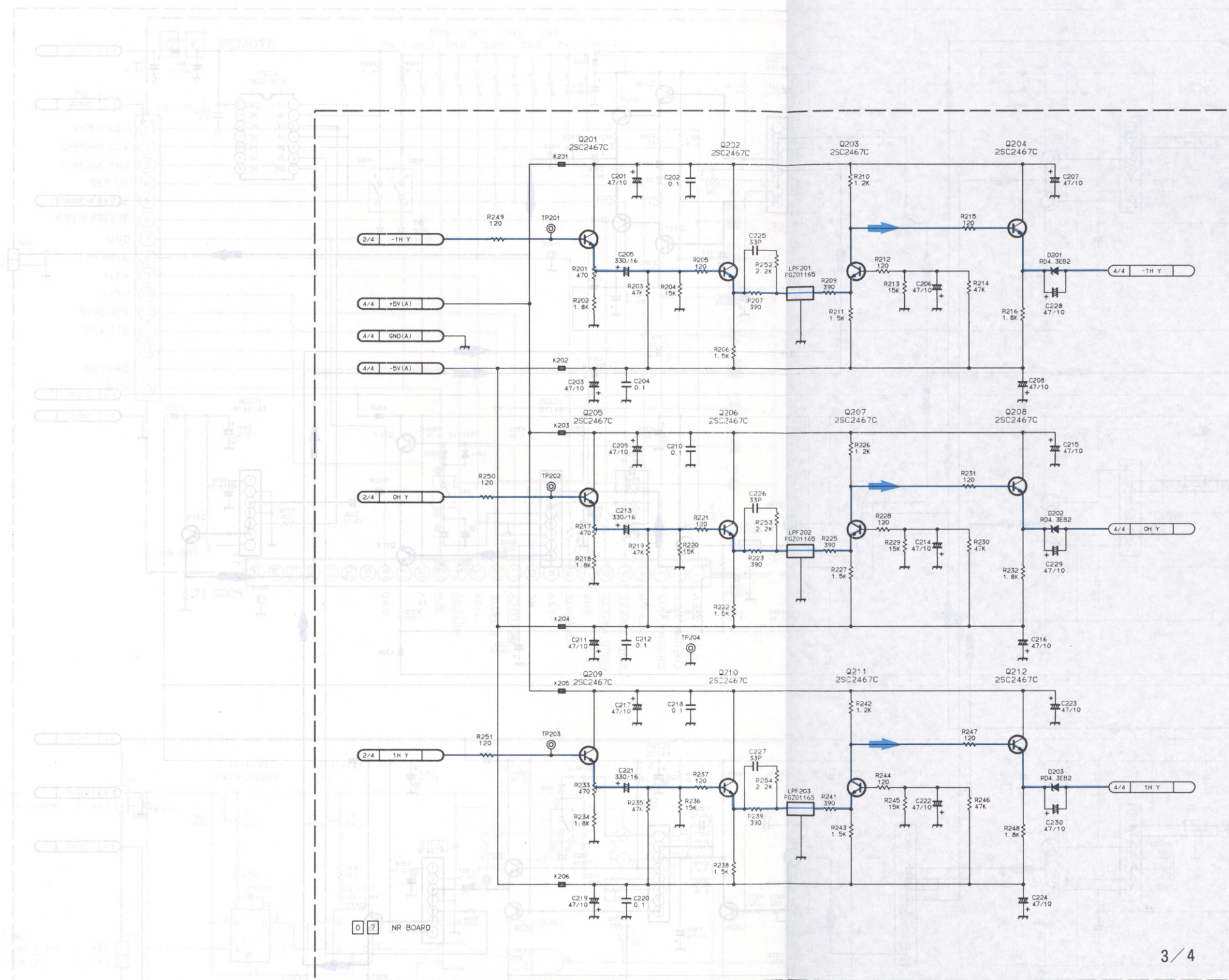


2.15 NOISE REDUCER SCHEMATIC DIAGRAM





2.17 REMOTE AND CHROMA BLK SCHEMATIC DIAGRAMS



6

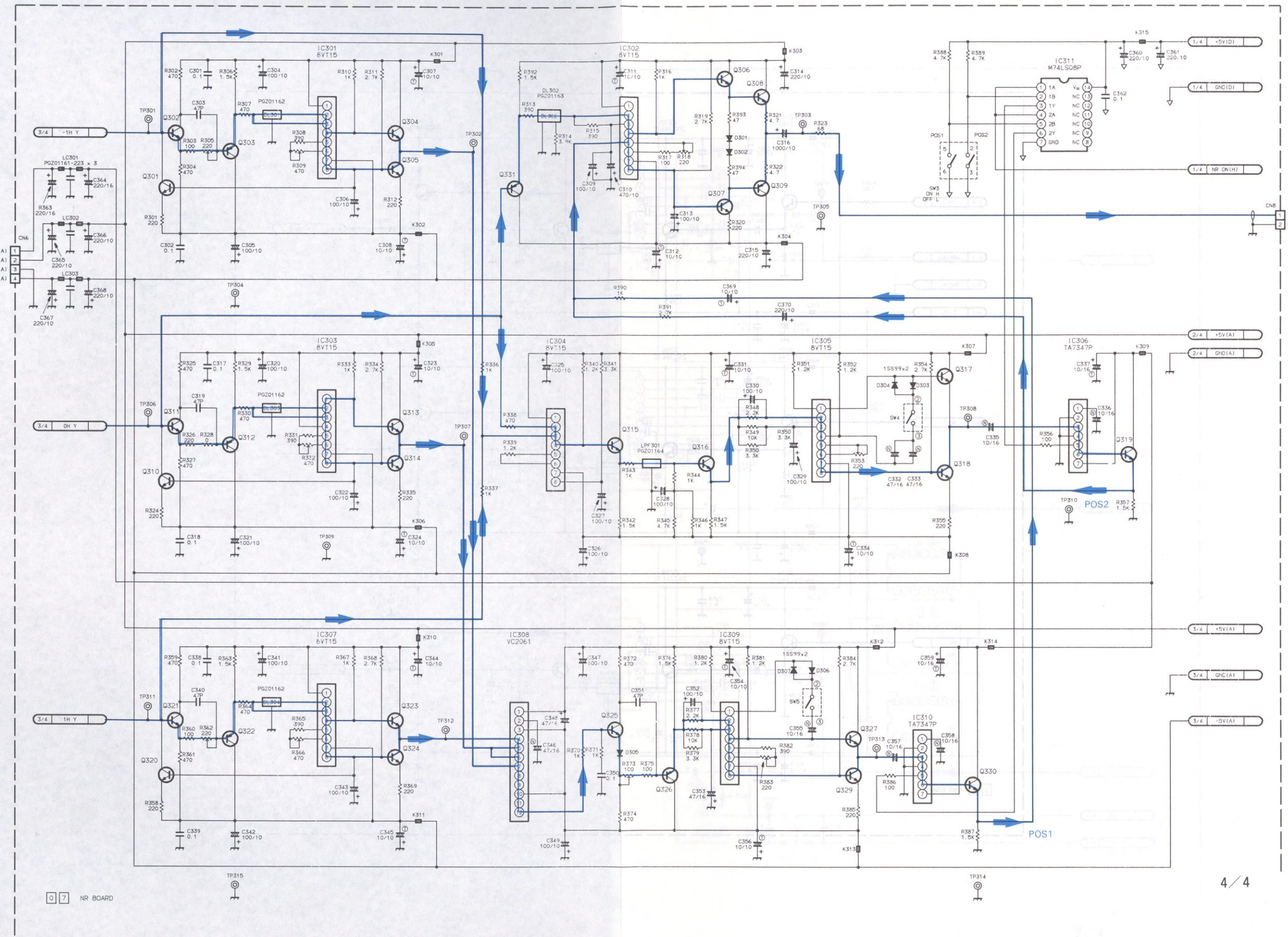
5

4

3

2

1

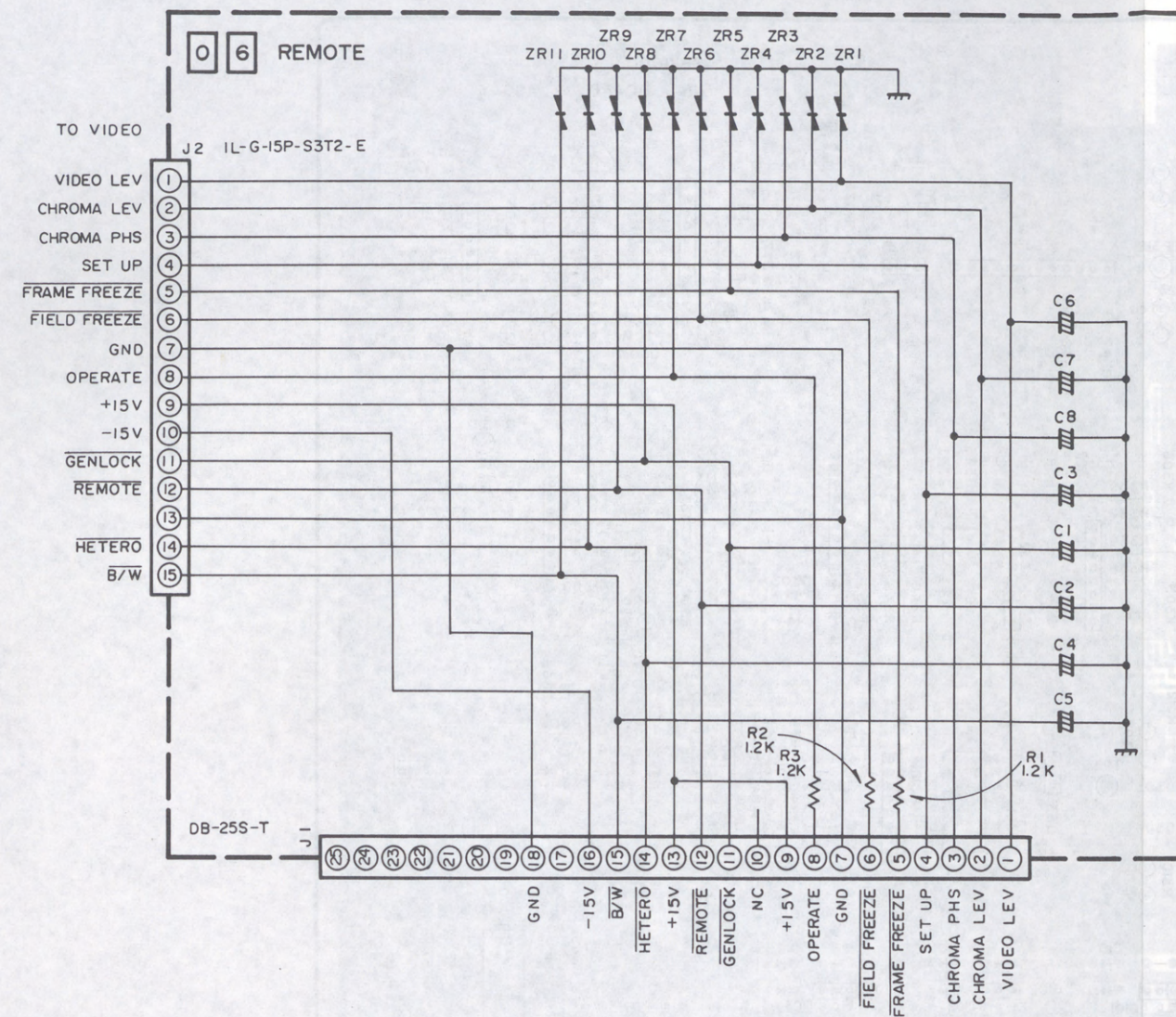


0 7 NR BOARD

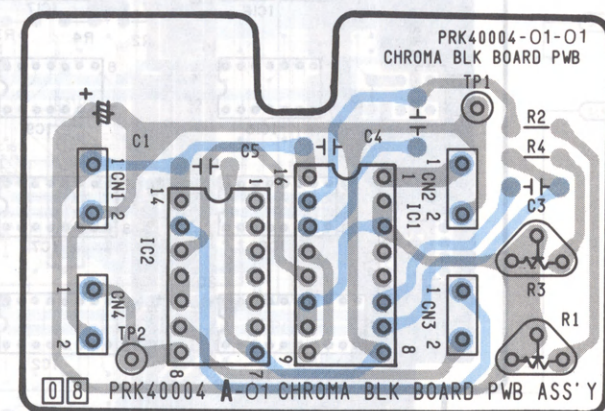
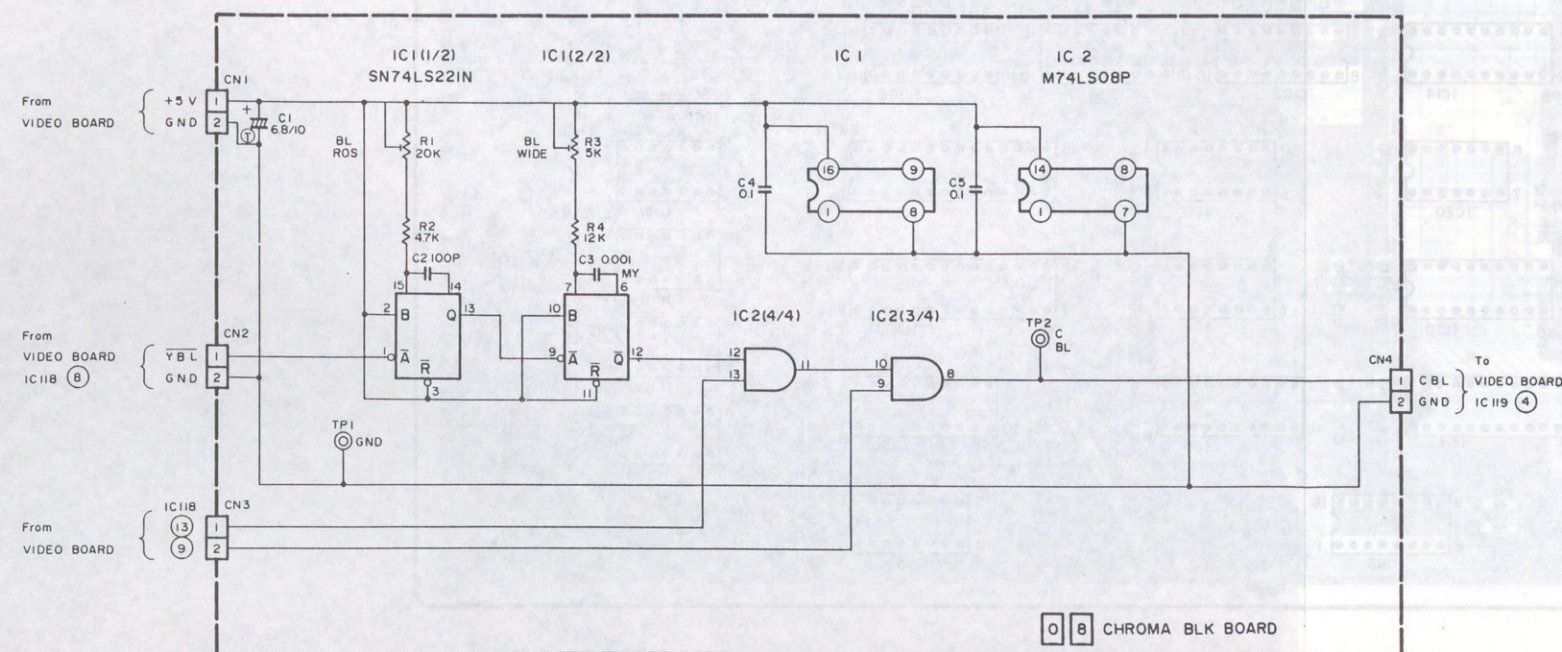
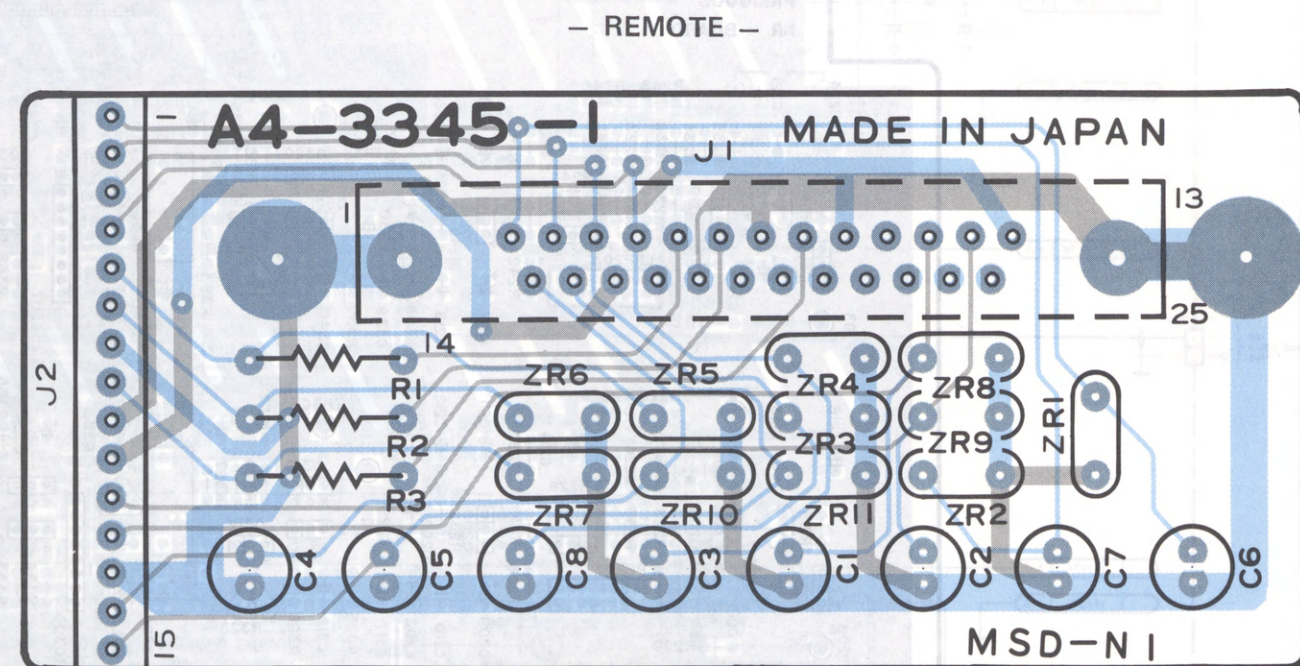
4/4



2.17 REMOTE AND CHROMA BLK SCHEMATIC DIAGRAMS



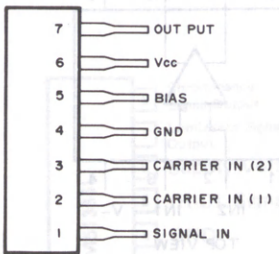
2.18 REMOTE AND CHROMA BLK CIRCUIT BOARDS



2.19 IC BLOCK DIAGRAMS

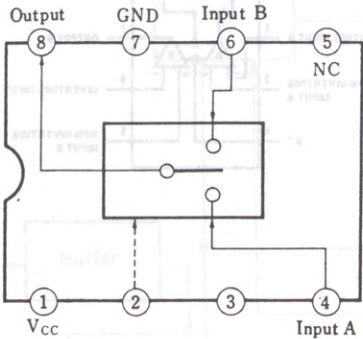
— AN612 —

Balance Modulator Circuit



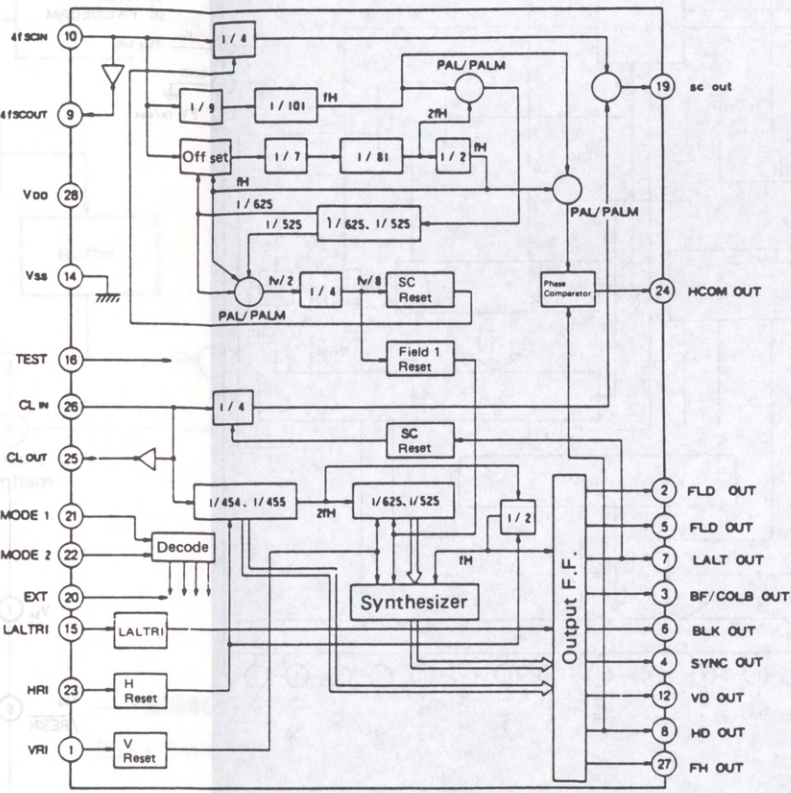
— AN6308 —

VTR Analog Switching Circuit



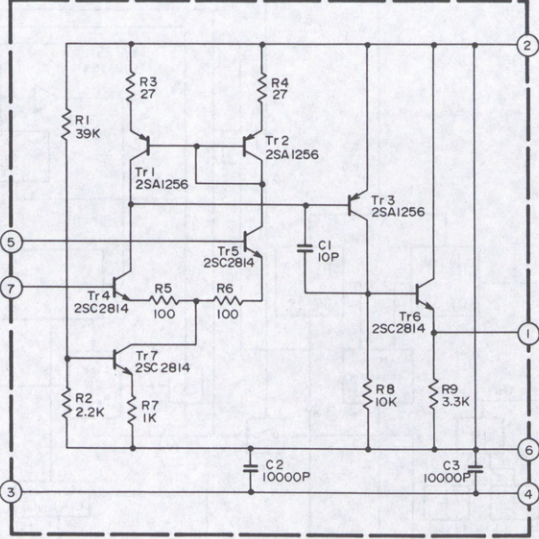
— CX7930A —

Sync Generator



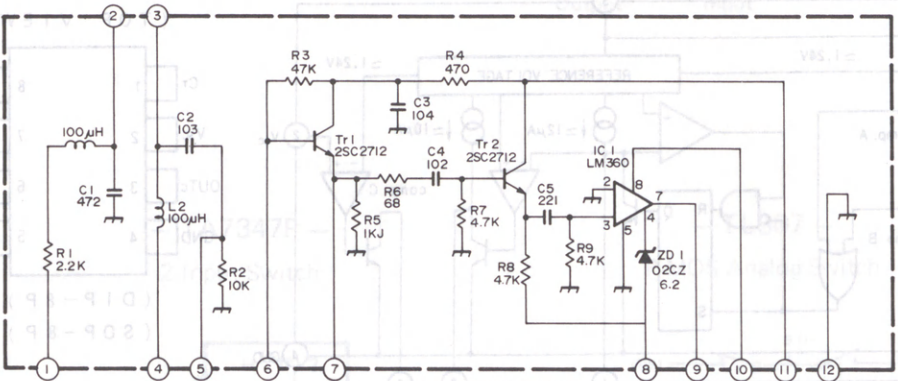
— FH-005 —

H-IC



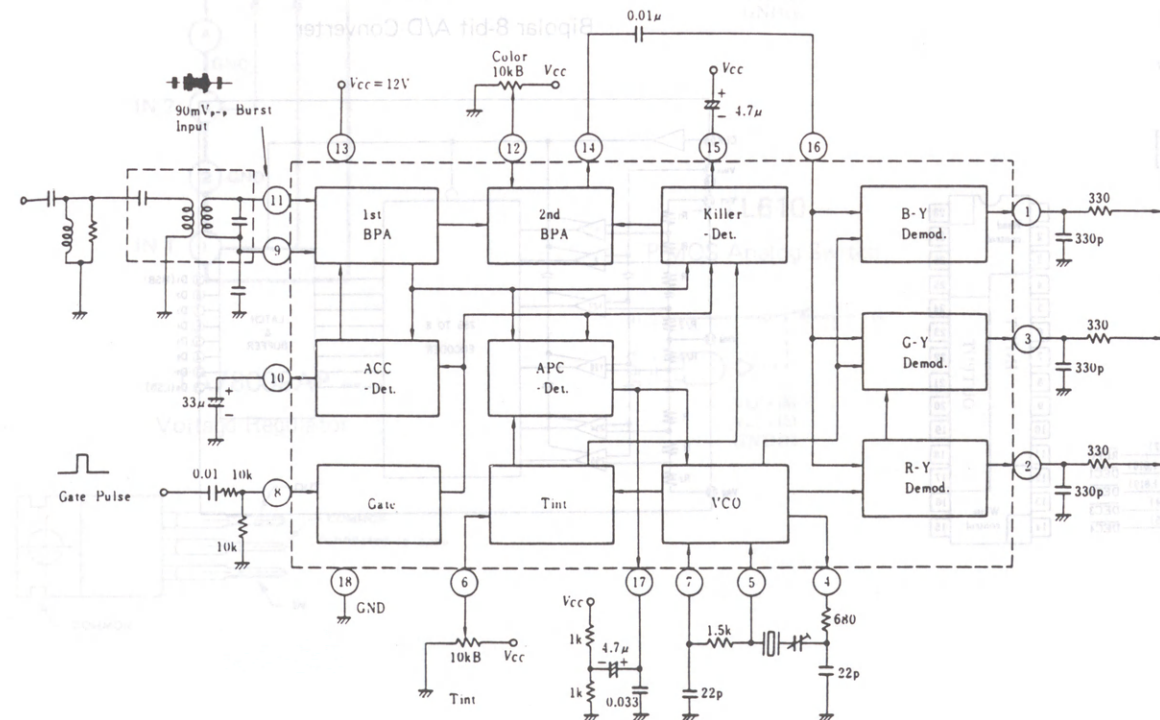
— FH-001 —

H-IC



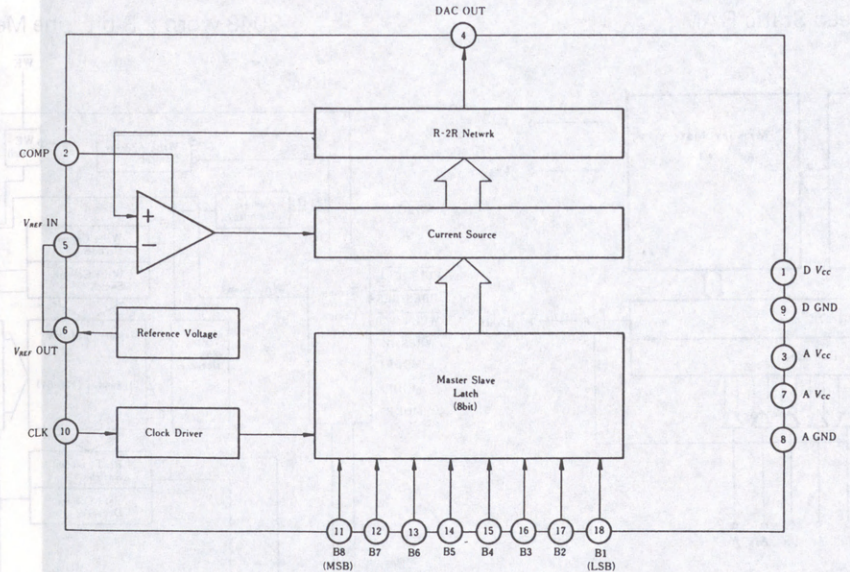
— HA11247 —

NTSC Color TV Chroma Processor

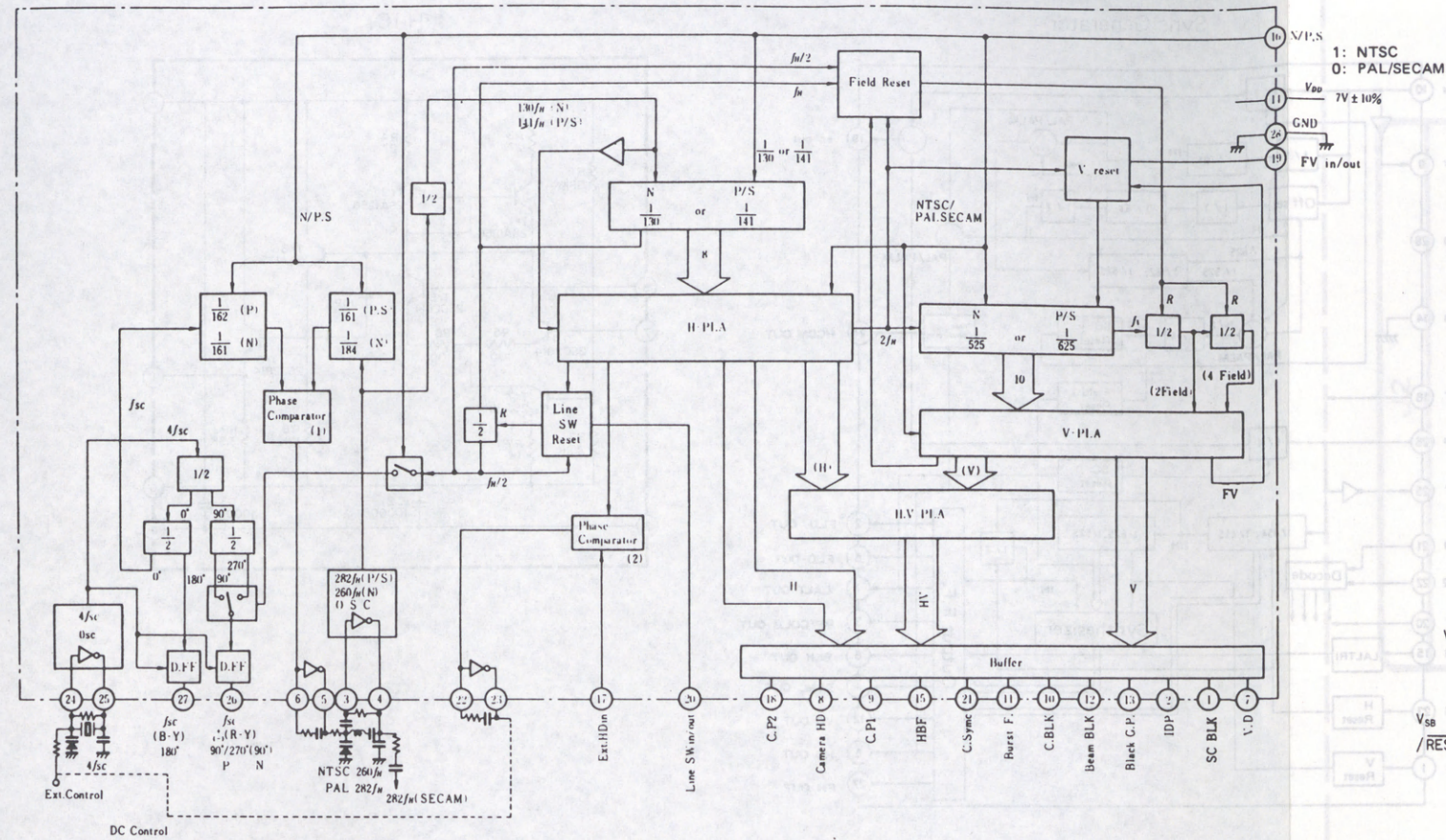


— HA19510 —

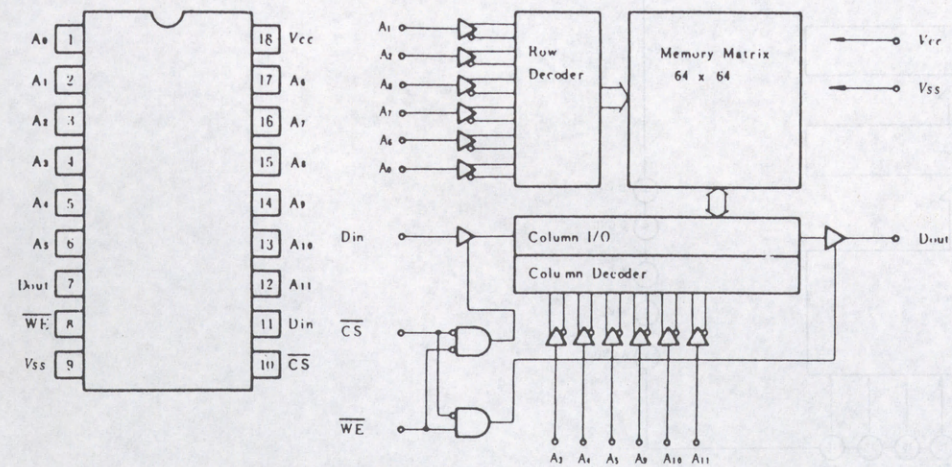
D/A Converter



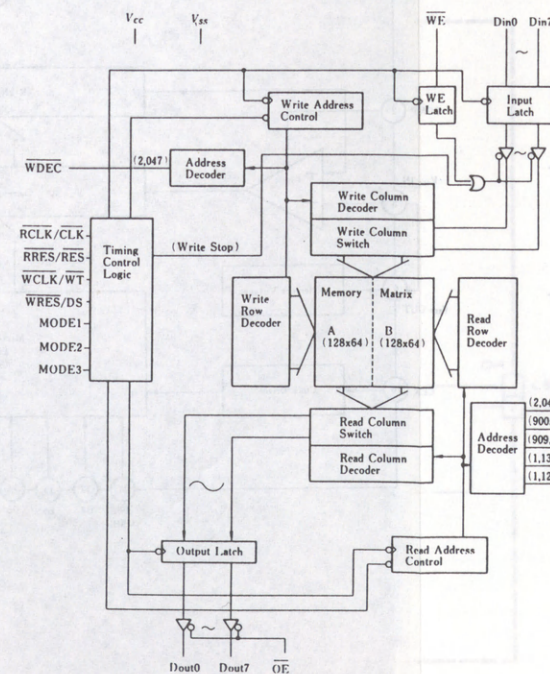
— HA440072 —
Sync Generator



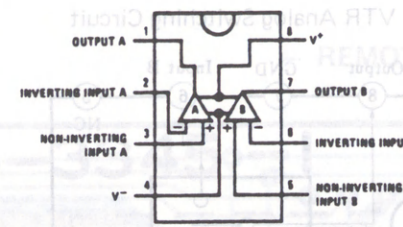
— HM6147P —
16384-word x 1-bit High Speed Static RAM



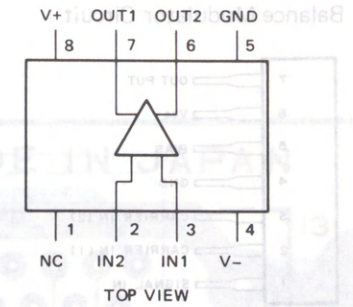
— HM63021 —
2048 word x 8-bit Line Memory



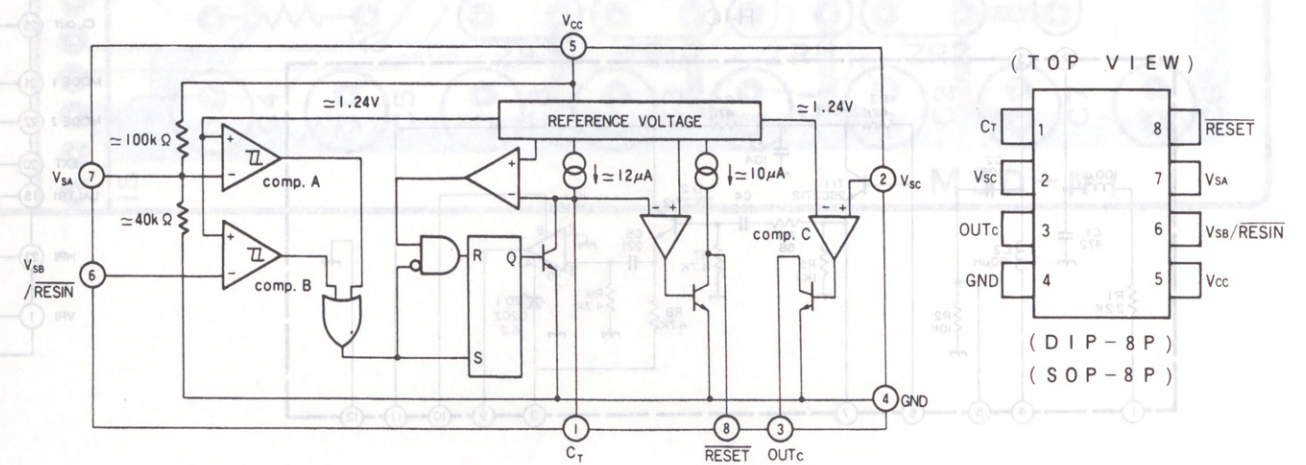
— LF353N —
JFET Input Operational Amplifier



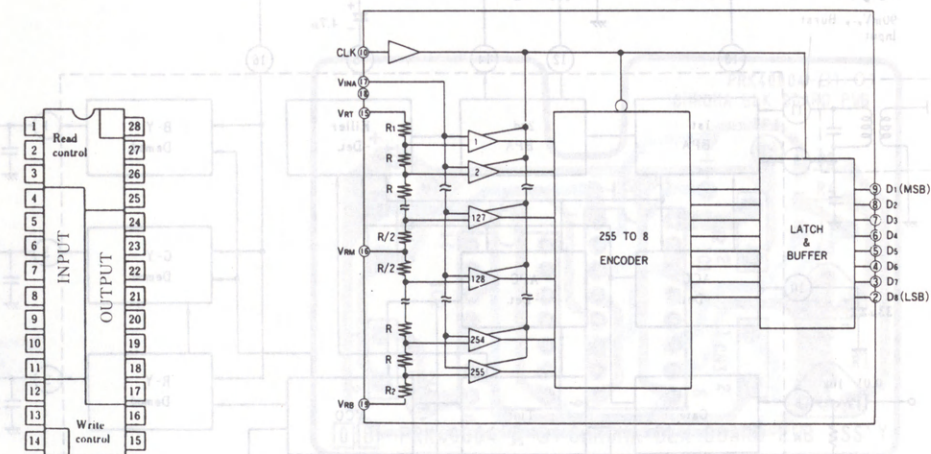
— LM360 —
Voltage Comparator



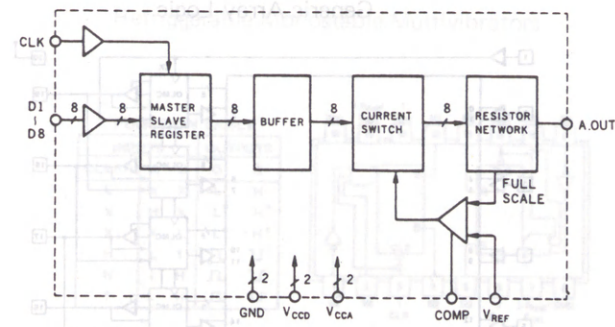
— MB3771 —
Voltage Comparator



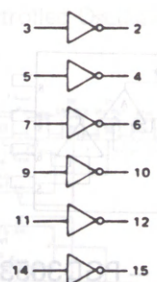
— MB40578 —
Bipolar 8-bit A/D Converter



— MB40778 —
8-bit D/A Converter

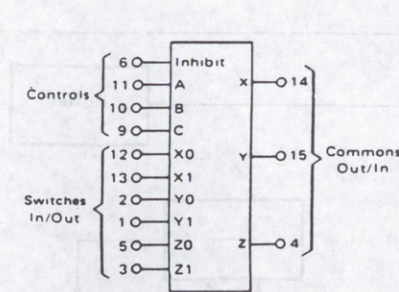


— MC14049UB —
Hex Buffers



NC = Pin 13, 16
VSS = Pin 8
VCC = Pin 1

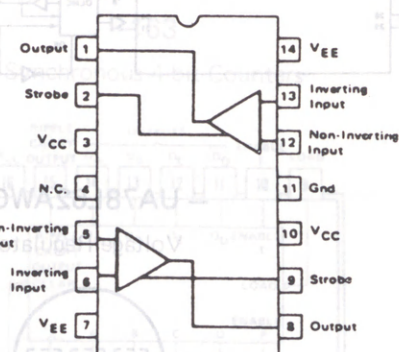
— MC14053B —
Analog Multiplexer/Demultiplexer



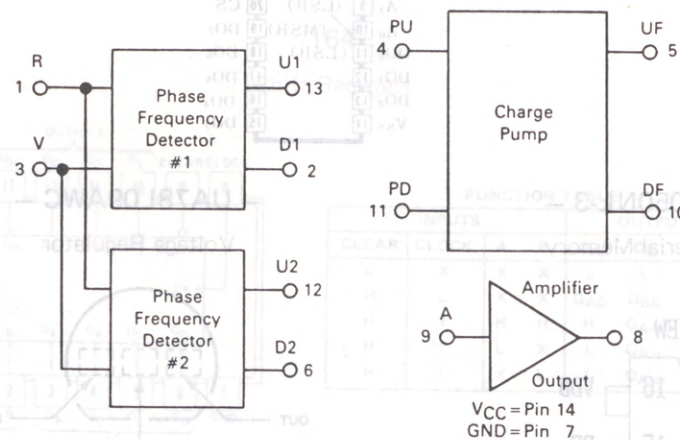
VDD = Pin 16
VSS = Pin 8
VEE = Pin 7

Control Inputs		ON Switches	
Inhibit	Select C* B A	MC14053B	
0	0 0 0	Z0 Y0 X0	
0	0 0 1	Z0 Y0 X1	
0	0 1 0	Z0 Y1 X0	
0	0 1 1	Z0 Y1 X1	
1	1 0 0	Z1 Y0 X0	
1	1 0 1	Z1 Y0 X1	
1	1 1 0	Z1 Y1 X0	
1	1 1 1	Z1 Y1 X1	
1	x x x	None	

— MC1414P —
Differential Comparator

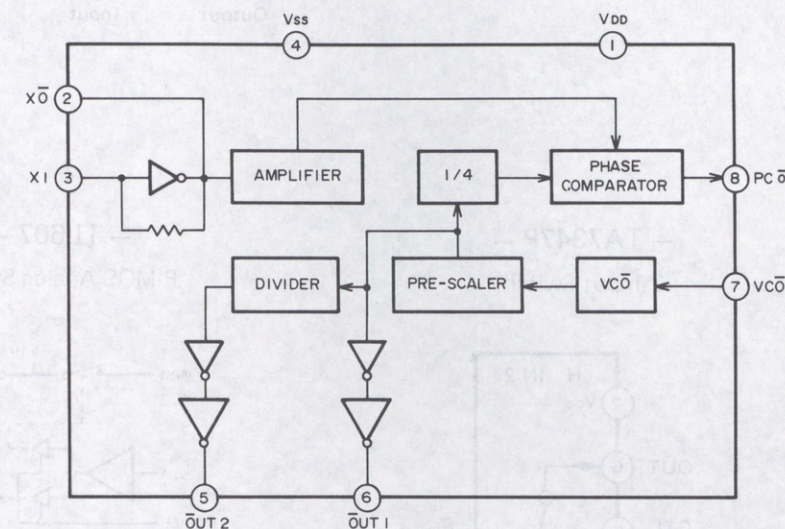


— MC4044 —
Phase-Frequency Detector

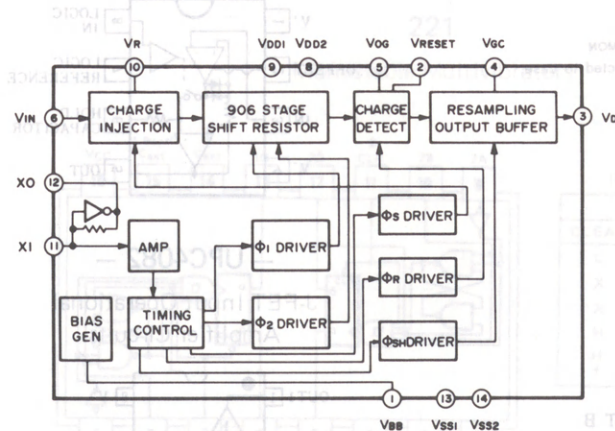


VCC = Pin 14
GND = Pin 7

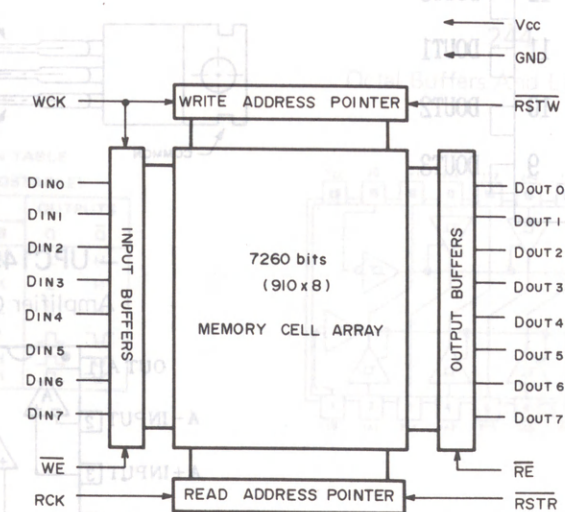
— MN3106 —
Clock Generator



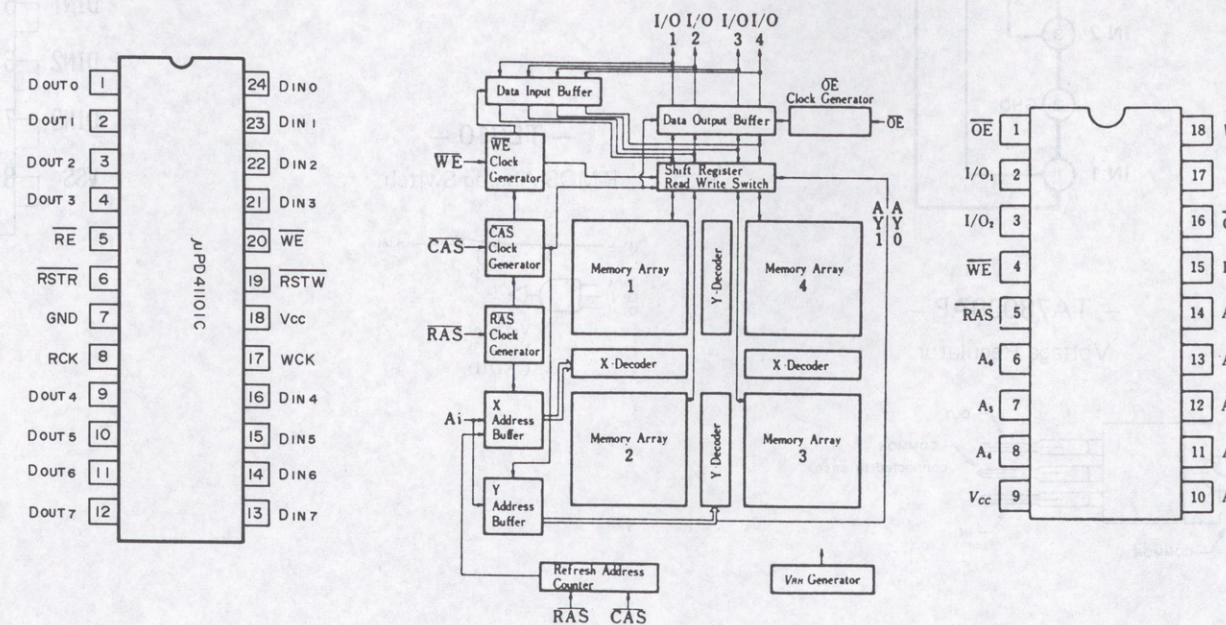
— MN3801 —
CCD Video Signal Delay Circuit



— UPD41101 —
Line Buffers

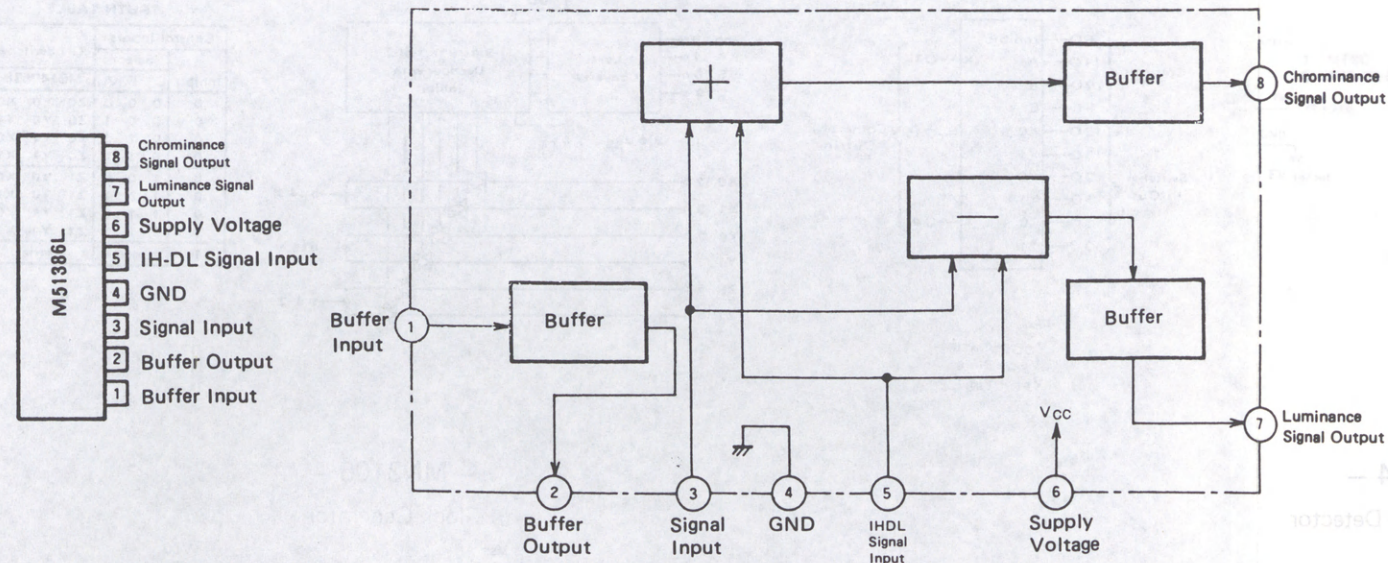


— M5M4464P-12 —
65536-word x 4-bit Dynamic RAM



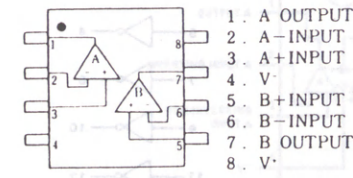
— M51386L —

Comb Filter



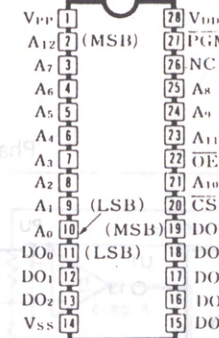
— NJM4556D —

High Current Operational Amplifier



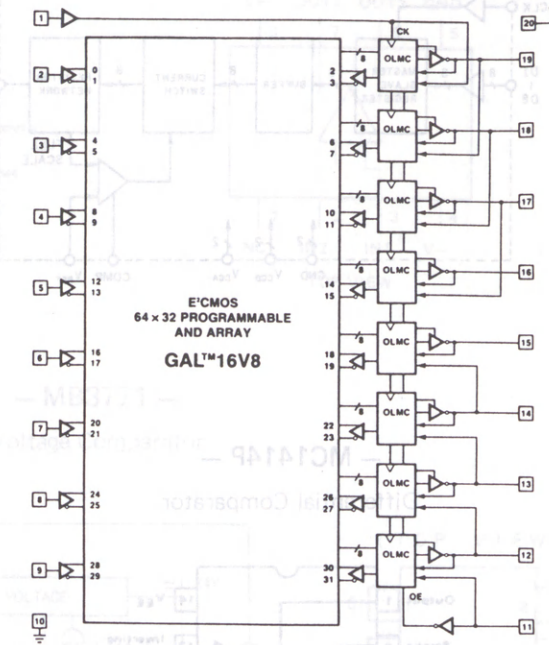
— PGD30533 — (LH5762J)

UV-EPROM



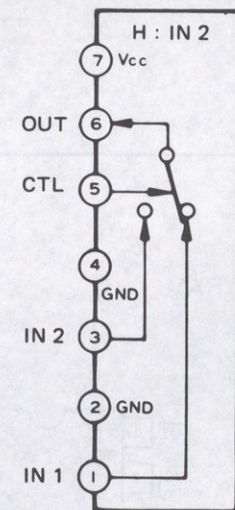
— PM-2314 ~ 2321 — (GAL16V8)

Generic Array Logic



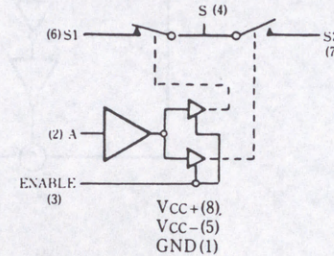
— TA7347P —

2-Input Switch



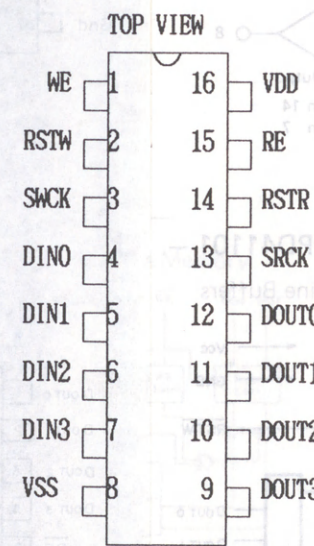
— TL607 —

P-MOS Analog Switch



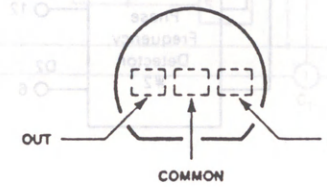
— TMS4C1050NL-3 —

263 x 4 bit Serial Memory



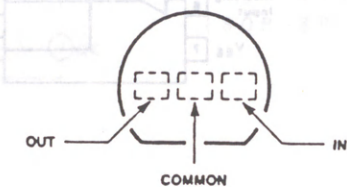
— UA78L09AWC —

Voltage Regulator



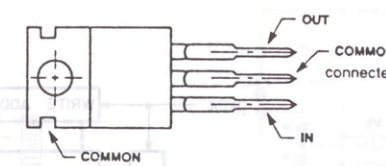
— UA78L62AWC —

Voltage Regulator



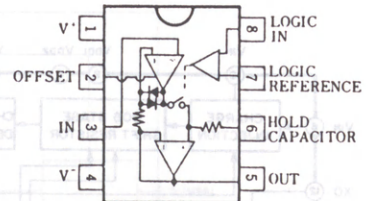
— UA7805UC —

Voltage Regulator



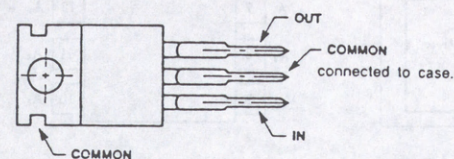
— UPC398C —

Sample And Hold Circuit



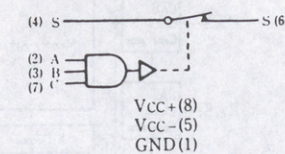
— TA78009AP —

Voltage Regulator



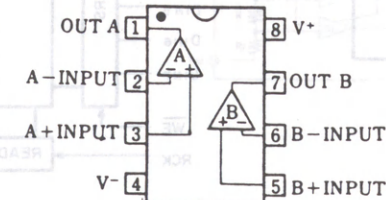
— TL610 —

P-MOS Analog Switch



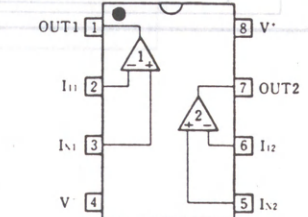
— UPC1458C —

Amplifier Circuits



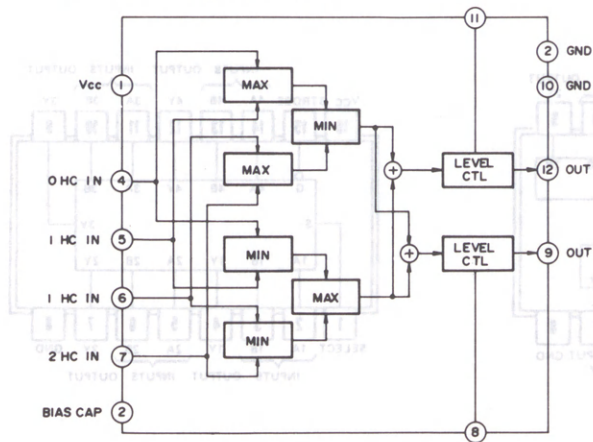
— UPC4082 —

J-FET Input Operational Amplifier Circuits



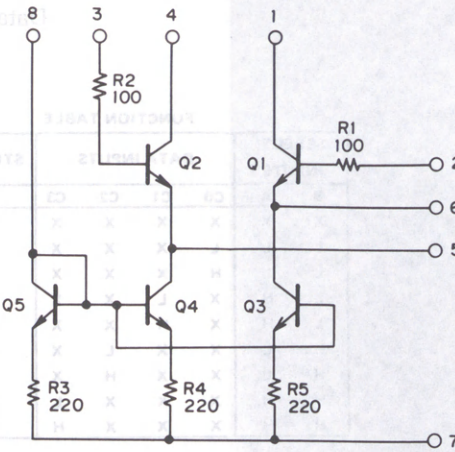
— VC2061 —

Cross Talk Concel Circuit



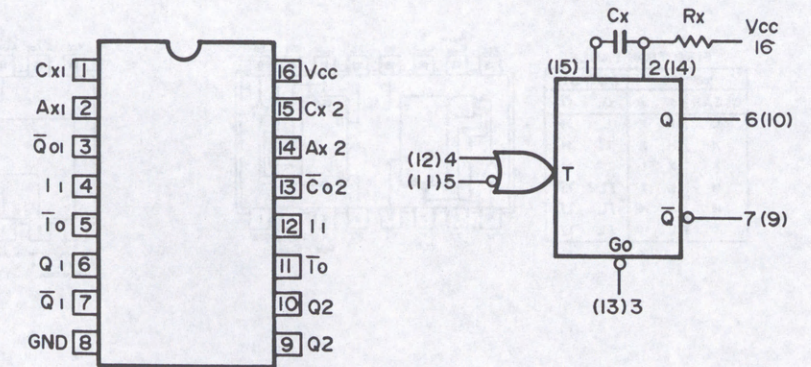
— 8VT15 —

H-IC



— 9602PC —

Retriggerable Resettable
Monostable Multivibrator



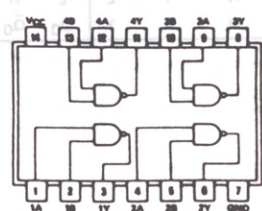
Vcc = Pin 16
GND = Pin 8

— 74 Families Of Compatible TTL Circuits —

00

Nand Gates

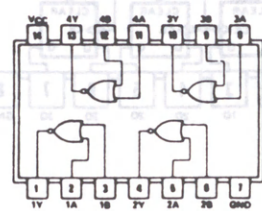
$$Y = \overline{AB}$$



02

Nor Gates

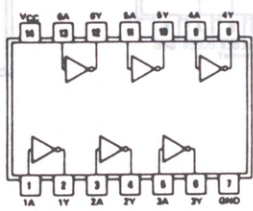
$$Y = \overline{A+B}$$



04/05/06

Hex Inverters

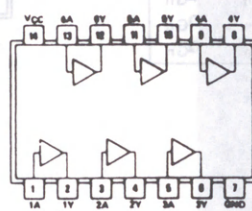
$$Y = \overline{A}$$



07

Hex Buffers/Drivers

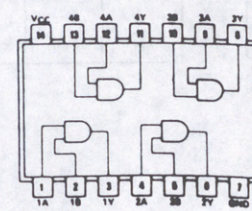
$$Y = A$$



08

And Gates

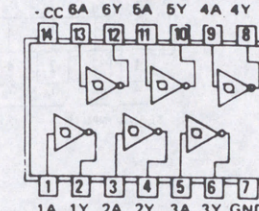
$$Y = AB$$



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Hex Schmitt-Trigger Inverters

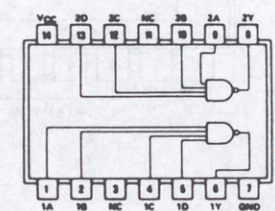
$$Y = \overline{A}$$



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Nand Gates

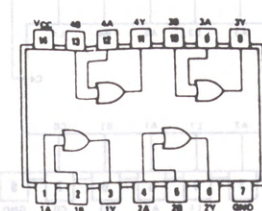
$$Y = \overline{ABCD}$$



32

Or Gates

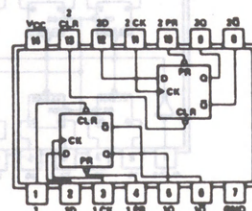
$$Y = A+B$$



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D-Type Flip-Flops

FUNCTION TABLE						
INPUTS			OUTPUTS			
PRESET	CLEAR	CLOCK	D	Q	\overline{Q}	
L	H	X	X	H	L	
H	L	X	X	L	H	
L	L	X	X	H*	H*	
H	H	1	H	H	L	
H	H	1	L	L	H	
H	H	L	X	Q ₀	\overline{Q}_0	



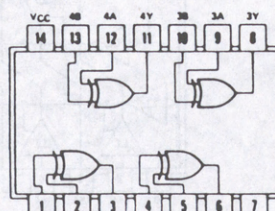
86

Exclusive-Or Gates

$$Y = A \oplus B = \overline{A}B + A\overline{B}$$

FUNCTION TABLE		
INPUTS		OUTPUT
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

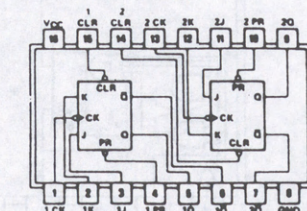
H = high level, L = low level



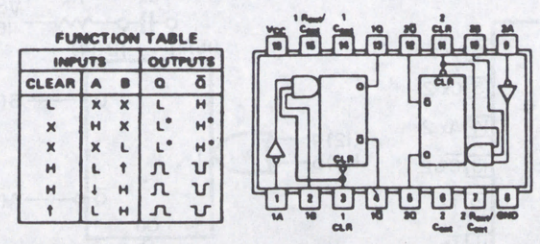
112A

J-K Flip-Flops

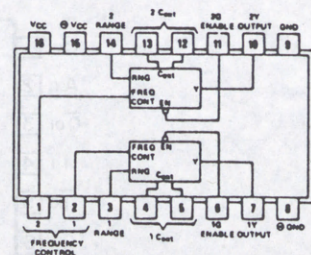
FUNCTION TABLE						
INPUTS			OUTPUTS			
PRESET	CLEAR	CLOCK	J	K	Q	\overline{Q}
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H*	H*
H	H	1	L	L	Q ₀	\overline{Q}_0
H	H	1	H	L	H	L
H	H	1	L	H	L	H
H	H	1	H	H	TOGGLE	TOGGLE
H	H	H	X	X	Q ₀	\overline{Q}_0



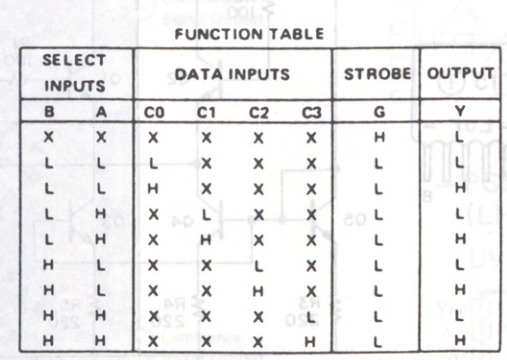
123
Retriggerable Monostable Multivibrators



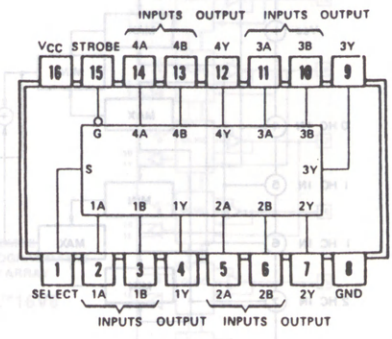
124
Voltage-Controlled Oscillators



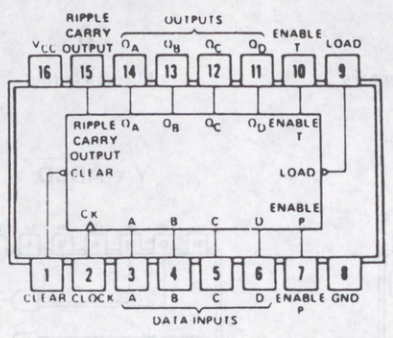
153
Data Selectors/Multiplexers



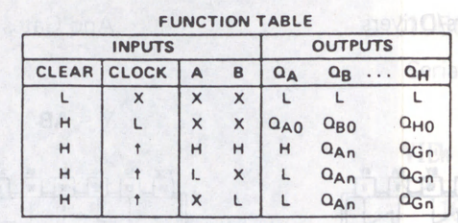
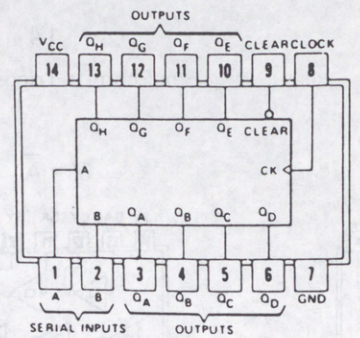
157
Data Selectors/Multiplexer



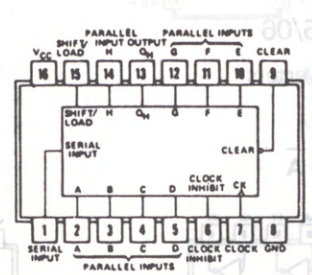
163
Synchronous 4-bit Counters



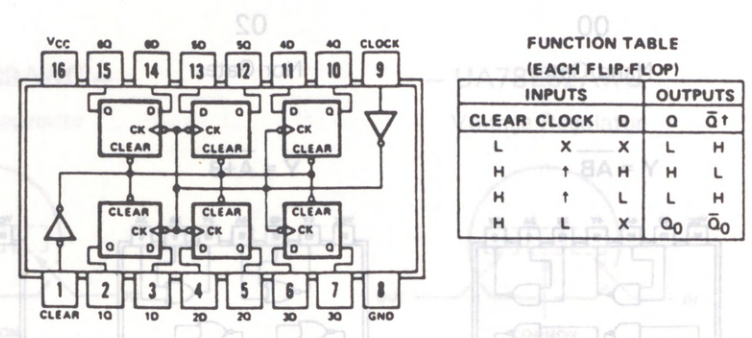
164
Shift Registers



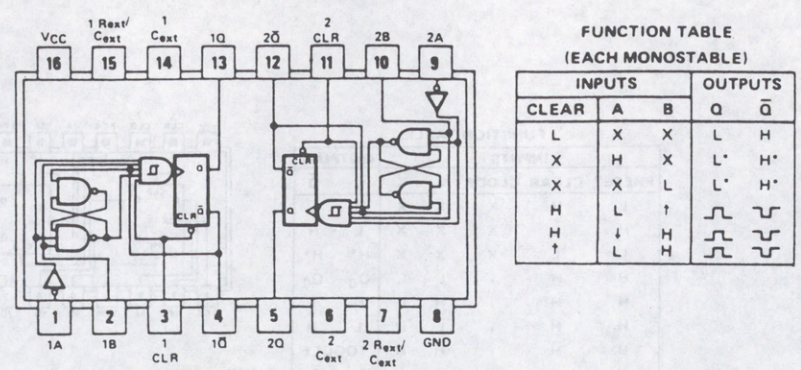
166
8-bit Shift Registers



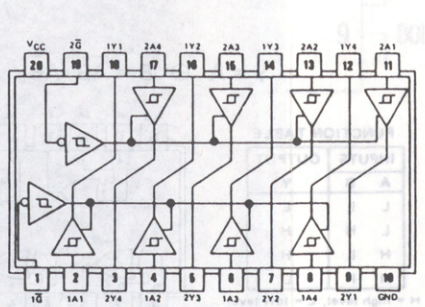
174
Hex D-Type Flip-Flops



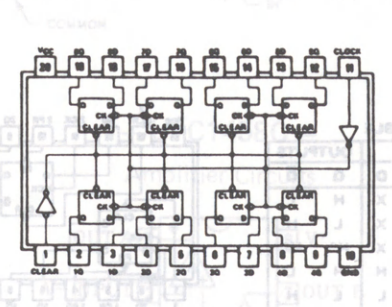
221
Monostable Multivibrators



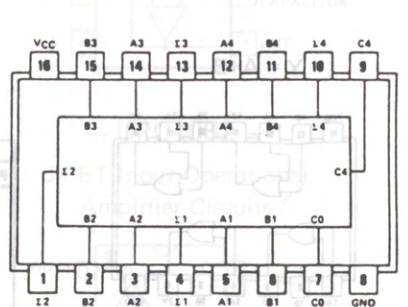
244
Octal Buffers And Line Drivers



273
Octal D-Type Flip-Flops

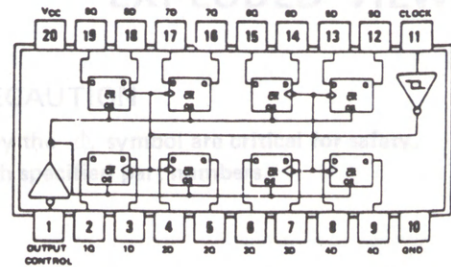


283
4-bit Binary Full Adders



374

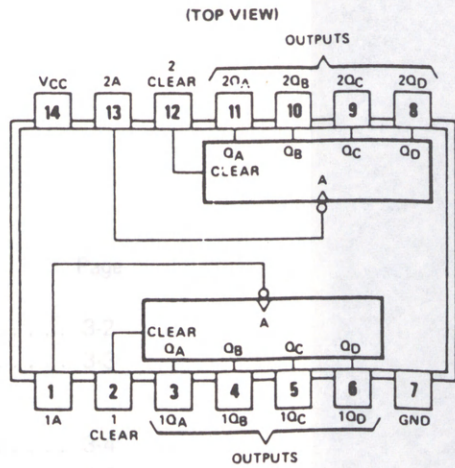
Octal D-Type Flip-Flops



FUNCTION TABLE			
OUTPUT CONTROL	CLOCK	D	OUTPUT
L	↑	H	H
L	↑	L	L
L	L	X	Q ₀
H	X	X	Z

393

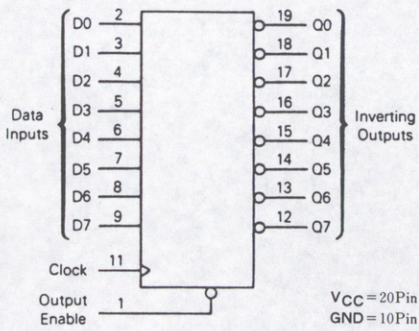
4-bit Binary Counters



COUNT SEQUENCE (EACH COUNTER)				
COUNT	OUTPUT			
	Q _D	Q _C	Q _B	Q _A
0	L	L	L	L
1	L	L	L	H
2	L	L	H	L
3	L	L	H	H
4	L	H	L	L
5	L	H	L	H
6	L	H	H	L
7	L	H	H	H
8	H	L	L	L
9	H	L	L	H
10	H	L	H	L
11	H	L	H	H
12	H	H	L	L
13	H	H	L	H
14	H	H	H	L
15	H	H	H	H

564

Octal D-Type Flip-Flop

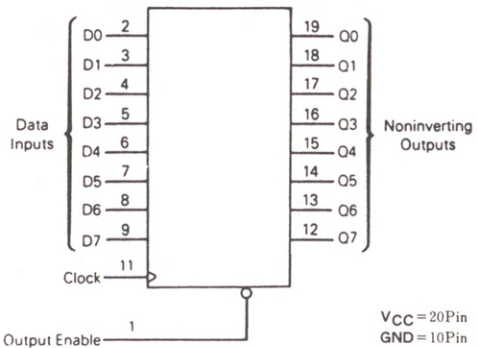


Inputs				Output
Output Enable	Clock	D	Q	
L	↑	H	L	L
L	↑	L	L	H
L	L	X	X	no change
H	X	X	X	Z

X = don't care
Z = high impedance

574

Octal D-Type Flip-Flop

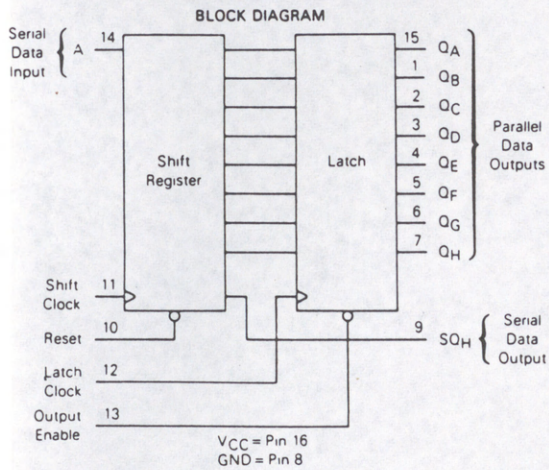
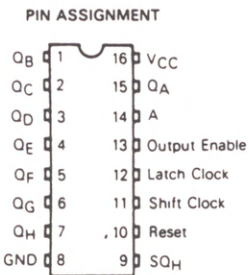


Inputs				Output
Output Enable	Clock	D	Q	
L	↑	H	L	L
L	↑	L	L	H
L	L	X	X	no change
H	X	X	X	Z

X = don't care
Z = high impedance

595


Shift Register with Latched



SECTION 3

EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the  symbol are critical for safety.

Replace only with specified part numbers.

3.1 STANDARD PART NUMBER CODING

3.1.1	Screw coding	3-2
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3.1.2	Fuse coding	3-3
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3.2 EXPLODED VIEWS AND PARTS LIST

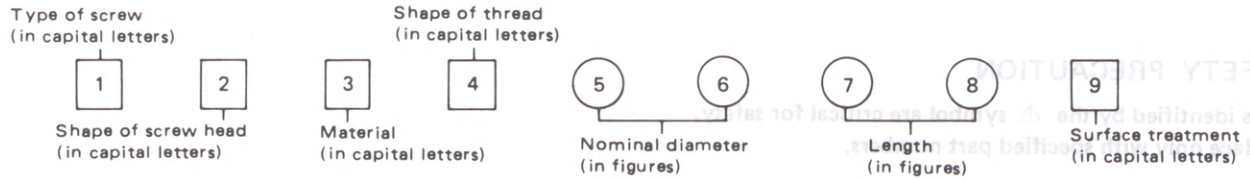
3.2.1 Packing assembly <M1>..... 3-4

3.2.2 Chassis assembly <M2> 3-6

3.1 STANDARD PART NUMBER CODING

3.1.1 Screw coding

Standard screw part numbers are as follows.

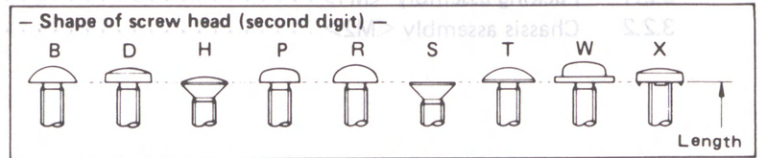
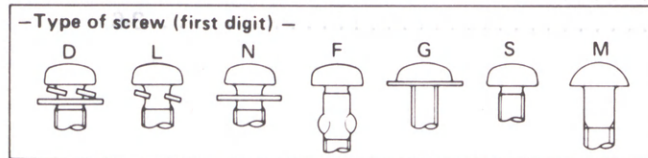


Type of screw (first digit)

- S Normal screws
- D Assembled machine screws (with plain and spring washers)
- L " (with spring washer)
- N " (with plain washer)
- F Feather screws
- G Washer head tapping screws
- M Wood screws

Shape of screw head (second digit)

- B Brazier head
- D Binding head
- H Oval countersunk head
- P Pan head
- R Round head
- S Flat head
- T Truss head
- W Washer head (machine screws)
- X Toothed head



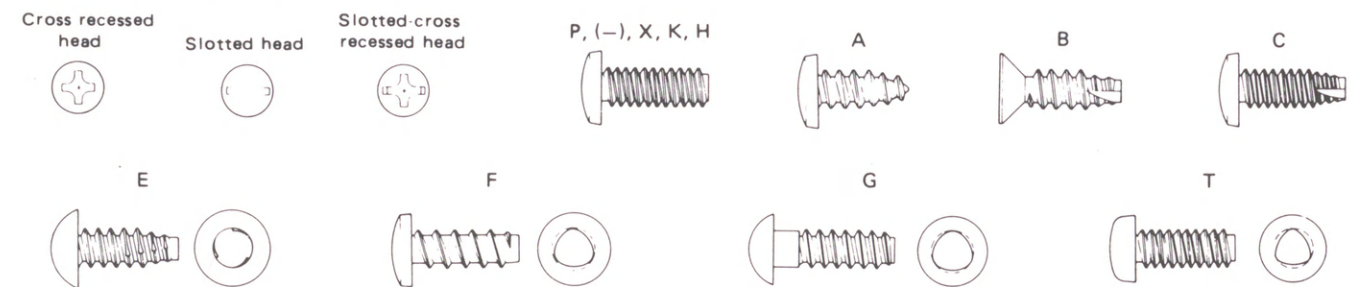
Material (third digit)

- S Steel
- E Stainless steel
- C Cast iron
- U Copper
- B Brass
- P Phosphor bronze
- N Nickel silver
- Y Cast brass
- A Aluminum
- Z Zinc alloy
- K Polycarbonate

Shape of thread (fourth digit)

- P Cross recessed head screws
- (-) Slotted head machine screws
- X Slotted-cross recessed head machine screws
- K Cross recessed head machine screws for precision equipment (type 1)
- H " (type 3)
- A Cross recessed head tapping screws (type 1)
- B " (type 2)
- C " (type 3)
- E Cross recessed head special tapping screws (brand : evertight)
- F " (brand : P-tight)
- T " (brand : taptight)
- G " (brand : taptight)

Shape of thread (fourth digit)



Nominal diameter (fifth and sixth digits)

The fifth and sixth digits are numbers indicating a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

Length (seventh and eighth digits)

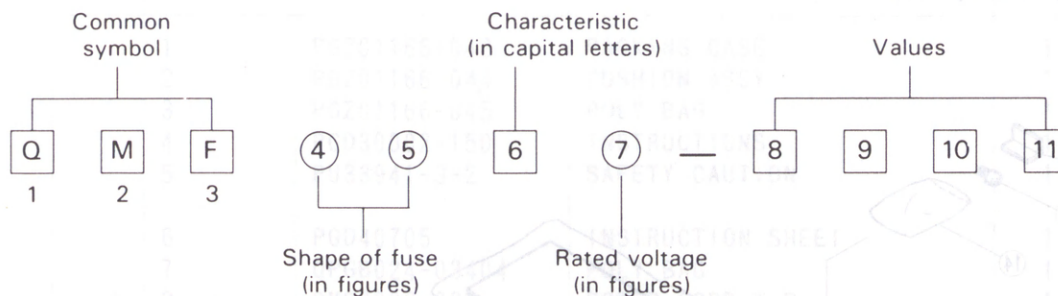
The seventh and eighth digits are numbers indicating length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

Surface treatment (ninth digit)

- Z Dichromate treatment after galvanizing (MFZn II-C)
- N Nickel plating (MFNi II, MFNi I)
- R Chromium plating (MBCr II, MBCr I)
- G Silver plating (SP4)
- B Black coating after plating
- F Blackening of iron (FB)
- M Blackening after galvanizing
- K Pickling of brass (PF2)
- P Phosphate treatment
- W Uni-chrome plating
- L Coating with transparent paint
- A Coloring red after galvanizing (MFZn II-C)
- C Coloring blue after galvanizing (MFZn II-C)
- T Coloring green after galvanizing (MFZn II-C)
- V Coloring purple after galvanizing (MFZn II-C)

3.1.2 Fuse coding

Standard fuse part numbers are as follows.



Shape of fuse

(fourth and fifth digits)

51	φ5.2 × 20 mm
60	φ6.4 × 30 mm
61	φ6.35 × 31.8 mm
63	φ6.4 × 30 mm with lead wires
66	φ6.35 × 31.8 mm with lead wires
00	Special type

Rated voltage

(seventh digit)

1	AC125 V
2	AC250 V
3	0.1 – 1 A : AC250 V
	1.25 – 6.3 A : AC125 V

Values

(eighth-tenth or eleventh digits)

example:

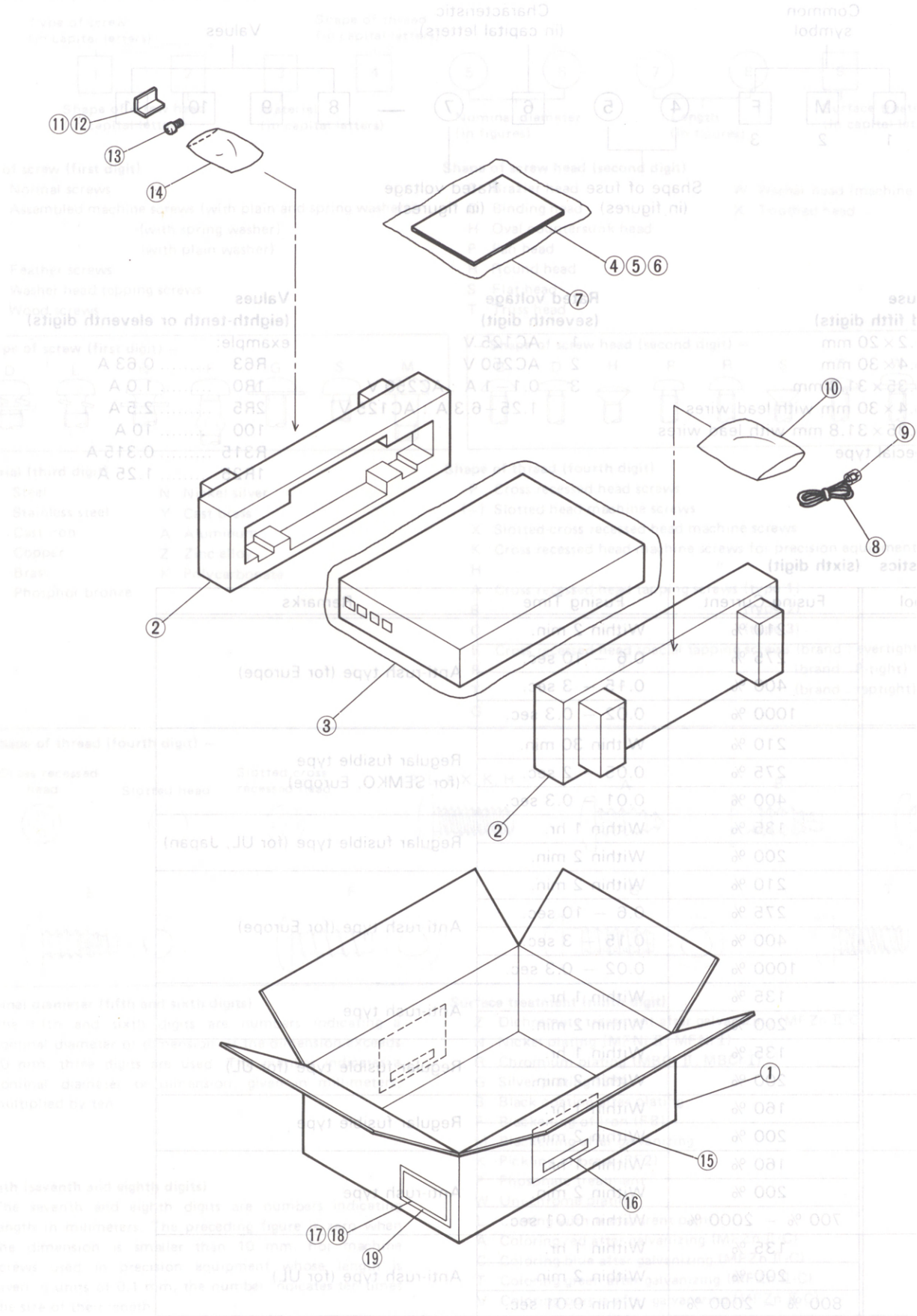
R63	..... 0.63 A
1R0	..... 1.0 A
2R5	..... 2.5 A
100	..... 10 A
R315	..... 0.315 A
1R25	..... 1.25 A

Characteristics (sixth digit)

Symbol	Fusing Current	Fusing Time	Remarks
A	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
B	210 %	Within 30 min.	Regular fusible type (for SEMKO, Europe)
	275 %	0.05 – 2 sec.	
	400 %	0.01 – 0.3 sec.	
C	135 %	Within 1 hr.	Regular fusible type (for UL, Japan)
	200 %	Within 2 min.	
E	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
J	135 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
M	135 %	Within 1 hr.	Regular fusible type (for UL)
	200 %	Within 2 min.	
R	160 %	Within 1 hr.	Regular fusible type
	200 %	Within 2 min.	
S	160 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
	700 % – 2000 %	Within 0.01 sec.	
U	135 %	Within 1 hr.	Anti-rush type (for UL)
	200 %	Within 2 min.	
	800 % – 2000 %	Within 0.01 sec.	

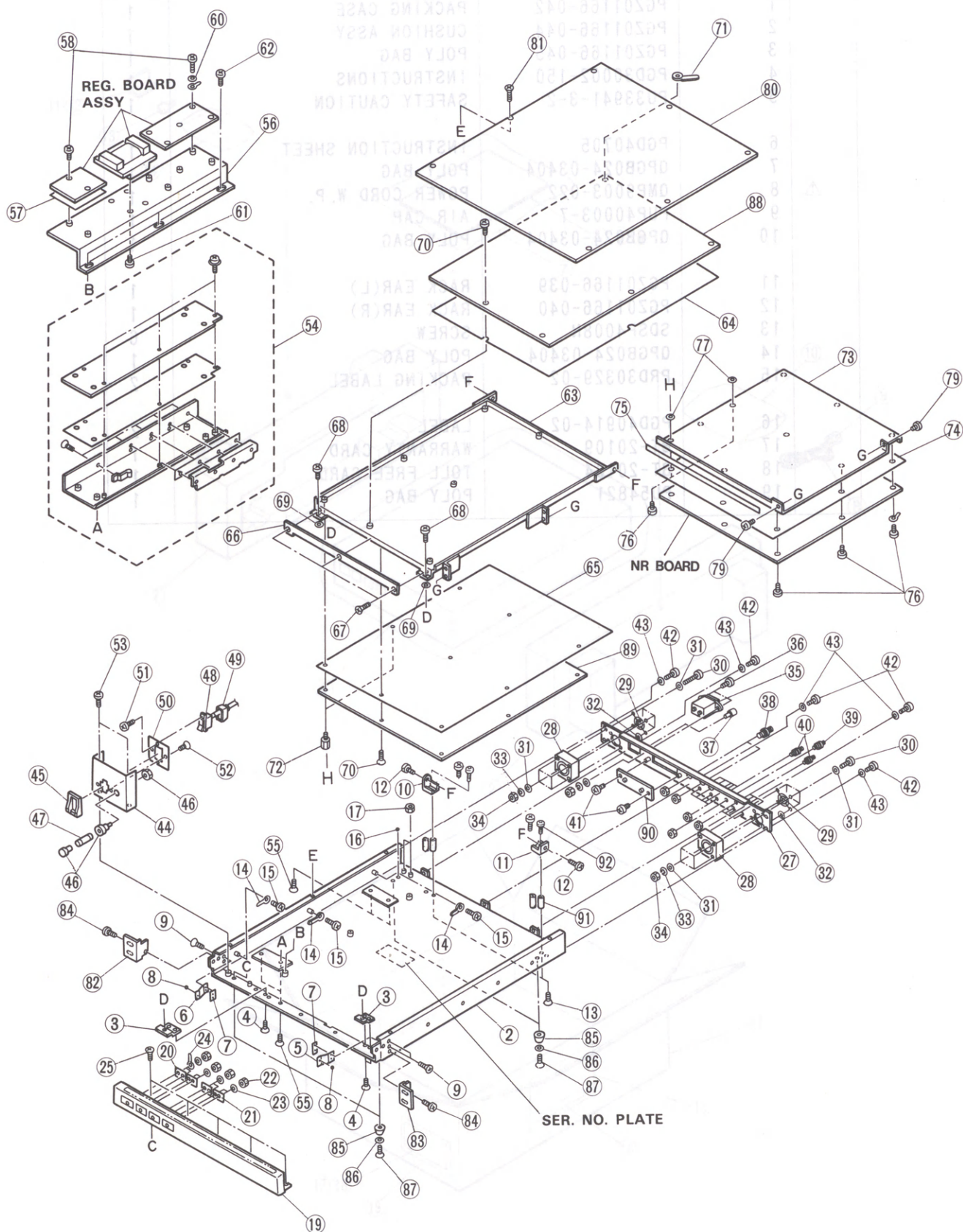
3.2 EXPLODED VIEWS AND PARTS LIST

3.2.1 Packing assembly <M1>



# ▲	REF NO.	PART NO.	PART NAME, DESCRIPTION	Q' TY
	1	PGZ01166-042	PACKING CASE	1
	2	PGZ01166-044	CUSHION ASSY	1
	3	PGZ01166-045	POLY BAG	1
	4	PGD30002-150	INSTRUCTIONS	1
	5	PU33941-3-2	SAFETY CAUTION	1
	6	PGD40705	INSTRUCTION SHEET	1
	7	QPGB024-03404	POLY BAG	1
▲	8	QMP9003-022	POWER CORD W.P.	1
	9	PUP40003-7	AIR CAP	1
	10	QPGB024-03404	POLY BAG	1
	11	PGZ01166-039	RACK EAR(L)	1
	12	PGZ01166-040	RACK EAR(R)	1
	13	SDSP4008N	SCREW	6
	14	QPGB024-03404	POLY BAG	1
	15	PRD30329-02	PACKING LABEL	2
	16	PGD40914-02	LABEL	2
	17	BT-20109	WARRANTY CARD	1
	18	BT-20104	TOLL FREE CARD	1
	19	PU54821	POLY BAG	1

3.2.2 Chassis assembly <M2>



#	REF NO.	PART NO.	PART NAME, DESCRIPTION	Q'TY
	1	PGZ01166-036	CHASSIS ASSY, Incl. 2-16	1
	2	PGZ01166-007	CHASSIS	1
	3	PGZ01166-021	BRACKET	2
	4	SSSP3006N	SCREW	4
	5	PGZ00910-030	SPRING PLATE(R)	1
	6	PGZ00910-031	SPRING PLATE(L)	1
	7	PGZ00910-029	PLATE	2
	8	PGZ00910-038	BEARING	2
	9	SSSP3006N	SCREW	4
	10	PGZ01166-019	SUPPORTER(L)	1
	11	PGZ01166-020	SUPPORTER(R)	1
	12	SDSP4008N	SCREW	2
	13	SSSP3006N	SCREW	4
	14	PU49485-2	WIRE CLAMP	3
	15	SDSP3006N	SCREW	3
	16	PU44457	STICKER	1
	17	NNS4000N	NUT	2
	18	PGZ01166-034	FRONT PANEL ASSY, Incl. 19-24	1
	19	PGZ01166-009	FRONT PANEL	1
	20	PGZ01166-003	LED BOARD ASSY, RED	1
	21	PGZ01166-004	LED BOARD ASSY, GREEN	3
	22	NNS3000N	NUT	8
	23	WNS3000N	WASHER	8
	24	PU49485-2	WIRE CLAMP	1
	25	SDSP3004N	SCREW	5
	26	PGZ01166-031	REAR PANEL ASSY, Incl. 27-41	1
	27	PGZ01166-011	REAR PANEL	1
	28	PGZ01157	FAN MOTOR	2
	29	PGZ01158	FAN GUARD	2
	30	SDSP3025N	SCREW	8
	31	WNS3000N	WASHER	16
	32	WAE3000N	WASHER	8
	33	WLS3000N	WASHER	8
	34	NNS3000N	NUT	8
⚠	35	PGZ00910-052	FILTER, (AC INLET)	1
	36	SDSP3010M	SCREW	2
⚠	37	PGZ00910-073	EARTH TERMINAL	1
	38	PGZ00910-060	7P CONNECTOR, OUTPUT	2
	39	PGZ00910-059	7P CONNECTOR, INPUT	1
	40	PGZ00910-058	BNC CONNECTOR	9
	41	SDSP3006N	SCREW	2
	42	SDSP3006N	SCREW	7
	43	WAE3000N	WASHER	7
	44	PGZ01166-016	SW & FUSE BRACKET	1
	45	PGD40682	SW GUARD	1

#	△	REF NO.	PART NO.	PART NAME, DESCRIPTION	Q'TY
△		46	PGZ00910-078	FUSE HOLDER	1
△		47	QMF51U1-3R15	FUSE	1
△		48	QSE2A21-L01	POWER SW	1
△		49	PU50479	SEESAW SW COVER	1
		50	PGZ01166-022	POWER SW BRACKET	1
		51	SDSP3006N	SCREW	2
		52	SDSP3004N	SCREW	2
		53	SDSP3006N	SCREW	2
△		54	PGZ00910-189	POWER SUPPLY	1
		55	SSSP4010N	SCREW	4
		56	PGZ01166-013	PSY SHIELD ASSY	1
		57	PU51858	INSULATOR COVER	1
		58	SDSP3006N	SCREW	7
		60	WLS3000N	WASHER	1
		61	SBSB4006ZY	SCREW	4
		62	SDSP3006N	SCREW	3
		63	PGZ01166-014	SHIELD PLATE ASSY	1
		64	PGZ00910-017	INSULATOR(A)	1
		65	PGZ00910-018	INSULATOR(B)	1
		66	PGZ01166-027	INDICATION PLATE	1
		67	SDSP2004M	SCREW	3
		68	PGZ00910-028	SCREW	2
		69	PGZ00910-040	WASHER	2
		70	SDSP3006N	SCREW	16
		71	PU49485-2	WIRE CLAMP	1
		72	PGZ01166-026	STUD SPACER	2
		73	PGZ01166-015	SHIELD PLATE	1
		74	PGZ01166-018	INSULATOR(C)	1
		75	PGZ01166-024	PLATE	1
		76	SDSP3006N	SCREW	9
		77	PGZ01166-025	SPACER	2
		79	PGZ00910-027	PIN	2
		80	PGZ00910-019	TOP PLATE	1
		81	SSSP3006N	SCREW	7
		82	—	RACK EAR(L), REFER TO <M1>	—
		83	—	RACK EAR(R), REFER TO <M1>	—
		84	—	SCREW, REFER TO <M1>	—
		85	PGZ00910-039	FOOT	4
		86	WNS3000N	WASHER	4
		87	SDSP3012N	SCREW	4
		88	PGZ01166-001	VIDEO BOARD ASSY <03>	1
		89	PGZ01166-002	MEMORY BOARD ASSY <05>	1
		90	PGZ01166-005	REMOTE BOARD ASSY <06>	1
		91	PGZ01166-023	STUD SPACER	4
		90	SDSP3006N	SCREW	4

SECTION 4 ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the  symbol are critical for safety. Replace only with specified part numbers.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS—All resistance values are in ohms (Ω), unless otherwise indicated.

k	: 1,000 (Kilo)
M	: 1,000,000 (Mega)
Chip R	: Chip Resistor
Chip VR	: Chip Variable Resistor
Comp. R	: Composition Resistor
CR	: Carbon Film Resistor
FR	: Fusible Resistor
MFR	: Metal Film Resistor
MPR	: Metal Plate Resistor
OMR	: Oxide Metal Film Resistor
PMR	: Precision Metal Film Resistor
UFR	: Unflammable Resistor
VR	: Variable Resistor (Potentiometer)
WR	: Wire Wound Resistor

CAPACITORS—All capacitance values are in μF , unless otherwise indicated.

pF	: μF (Pico farad)
C Cap	: Ceramic Capacitor
Chip Cap	: Chip Capacitor
Chip T Cap	: Chip Tantalum Capacitor
E Cap	: Electrolytic Capacitor
FM Cap	: Film Mica Capacitor
LL Cap	: Low Leak Current Electrolytic Capacitor
MM Cap	: Metalized Mylar Capacitor
MP Cap	: Metalized Paper Capacitor
MY Cap	: Mylar Capacitor
NP Cap	: Non-polar Capacitor
PC Cap	: Polycarbonate Capacitor
PP Cap	: Polypropylene Capacitor
PS Cap	: Polystyrol Capacitor
T Cap	: Tantalum Capacitor
TF Cap	: Thin Film Capacitor
TR Cap	: Trimmer Capacitor

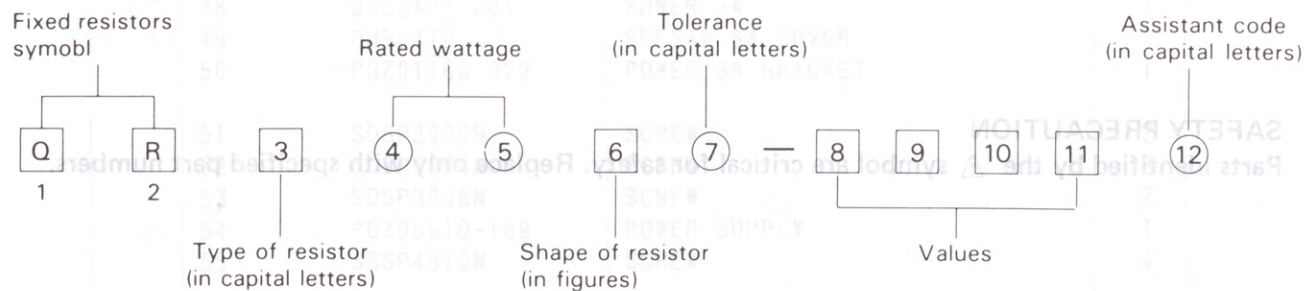
NOTES:

- [2 digits] indicates circuit board symbol number.
- "X" indicates quantities for use.
- IC symbol number with Roman letter indicates location on the circuit board.

4.1 STANDARD PART NUMBER CODING

4.1.1 Fixed resistor coding.

Fixed resistor part numbers are as follows.




Type of resistor (third digit)	Rated wattage (fourth and fifth digits)	Tolerance (seventh digit)	Assistant code (twelfth digit)
C Composition resistors	A0 1/10 W	F $\pm 1\%$	A Small type
D Carbon film resistors	18 1/8 W	G $\pm 2\%$	B Small type
F Unflammable resistors	16 1/6 W	J $\pm 5\%$	S Small type
G Oxide metal film resistors	14 1/4 W	K $\pm 10\%$	Y Lead taping
H Fusible resistors	12 1/2 W	M $\pm 20\%$	Z Lead taping
M Metal plate resistors	01 1 W		
S Metal glazed resistors	02 2 W		
V Precision metal film resistors	03 3 W		
W Wire wound resistors	04 4 W		
X Metal film resistors	05 5 W		
Z Special resistors	06 6 W		
	07 7 W		
	75 7.5 W		
	08 8 W		
	10 10 W		
	15 15 W		
	A6 16 W		
	20 20 W		
	30 30 W		

Values (eighth — tenth or eleventh digits)
examples:
R47 $0.47\ \Omega$
4R7 $4.7\ \Omega$
470 $47 \times 10^0 = 47\ \Omega$
471 $47 \times 10^1 = 470\ \Omega$
472 $47 \times 10^2 = 4.7\ \text{k}\Omega$
473 $47 \times 10^3 = 47\ \text{k}\Omega$
474 $47 \times 10^4 = 470\ \text{k}\Omega$
475 $47 \times 10^5 = 4.7\ \text{M}\Omega$

QVR resistance shown by four digits:
4640 $464 \times 10^0 = 464\ \Omega$
4641 $464 \times 10^1 = 4.64\ \text{k}\Omega$
4642 $464 \times 10^2 = 46.4\ \text{k}\Omega$

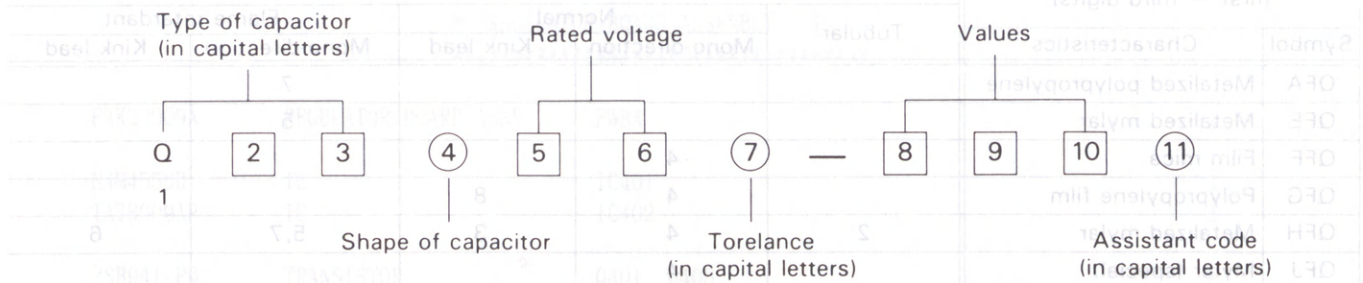
Shape of resistor (sixth digit)

Note:  marks are flame retardant resistor.

Type of resistor Shape of resistor	C	D	F	G	H	M	S	V	W	X
1										
2										
3										
4										
5									(L) type	
6										
7			Lug (B) type							
8			Lug (A) type					Chip		
9			Lug (C) type							

4.1.2 Fixed capacitor coding

Fixed capacitor part numbers are as follows.



Ceramic capacitors

Type of capacitor (first – third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Mono-direction	Kink lead	Axial lead	Axial forming lead	Chip
QCC	Ceramic	1		4	5	
QCD	High capacitance					A
QCF	High capacitance	1,4	3			8,A
QCS	Temperature compensation	1	3	4	5	8,A
QCT	Temperature compensation	Special coding				8,A
QCV	Ceramic			1	3	
QCX	Ceramic			1	3	
QCY	High capacitance	1,4	3	6	7	8,A
QCZ	Special type	Special coding				
QCB	Ceramic			B	C	

Electrolytic capacitors

Type of capacitor (first-third digits)		Shape of capacitor (fourth digit)				
Symbol	Characteristics	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEB	Low leakage		4	5	6	
QEC	Low leakage		4,8,A	9,B	6,C	
QEE	Tantalum (normal)		4	5	6	
	Tantalum (small)		8			
QEF	Chip tantalum		8 (chip type)			
QEG	Low impedance		4			
QEK	Miniature type		4	5	6	
QEL	Small type		4	5	6	7
QEM	Small type		4	5	6	
QEN	Non-polar	2	4	5	6	
QEP	Non-polar (small)		4,A	5,B	6,C	
QER	Miniature type		4	5	6	
QET	Small type	2	4	5,B	6,C	7
QEU	Small type		4	5	6	
QEV	Small type		4		6	7
QEW	Normal	2	4	5	6	7

Paper film capacitors

Type of capacitor (first — third digits)		Shape of capacitor (fourth digit)					
		Tubular	Normal		Flame retardant		
Symbol	Characteristics			Mono-direction	Kink lead	Mono-direction	Kink lead
QFA	Metalized polypropylene					7	
QFE	Metalized mylar					5	
QFF	Film mica			4			
QFG	Polypropylene film			4	8		
QFH	Metalized mylar	2		4	3	5,7	6
QFJ	Mylar (special)			4			
QFK	Metalized mylar (small)					5	
QFM	Mylar	2		4	3,7	5	6
QFN	Mylar (small)			4	3		
QFP	Polypropylene			4	3,8		
QFS	Polystyrole	2		4	3		
QFV	Thin film			4	8		
QFZ	Special type		Special coding				

Rated voltage (fifth and sixth digits)

Fifth digit \ Sixth digit	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15	4.0		6.3				
1	10		16	20	25		40	50	63	80	35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000				5000					

Tolerance (seventh digit)

A	+100 % -10 %	M	±20 %
F	±1 %	N	±30 %
G	±2 %	P	+100 % -0 %
H	+50 % -10 %	R	+30 % -10 %
J	±5 %	X	+40 % -20 %
K	±10 %	Z	+80 % -20 %

Values (eighth – tenth digits)

Example : Values are in picofarads

101	.....	10×10^1	pF	.....	100 pF
102	.....	10×10^2	pF	.....	1,000 pF (0.001 μ F)
103	.....	10×10^3	pF	.....	10,000 pF (0.01 μ F)
104	.....	10×10^4	pF	.....	100,000 pF (0.1 μ F)
105	.....	10×10^5	pF	.....	1 μ F
5R0	.....			.....	5.0 pF

Assistant code (eleventh digit)

G	Small size
Z	Lead taping
Y	Lead taping

		REF NO. ----->										
PART NO.	PART NAME, DESCRIPTION	1	2	3	4	5	6	7	8	QTY		

* REGULATOR BOARD ASSEMBLY<01> *												

PRK20009A	REGULATOR BOARD ASSY	PWBA										
NJM4556D	IC	IC401										
TA78009AP	IC	IC402										
2SB941(PQ)	TRANSISTOR	Q401 Q403									2	
2SD1266(PQ)	TRANSISTOR	Q402 Q404									2	
RD3. 0EB2	ZENER DIODE	D405										
RD4. 3EB2	ZENER DIODE	D404										
S1VB10	DIODE ARRAY	D403										
S4VB10	STACK DIODE	D401 D402									2	
QRD121J-471	RESISTOR	R401 R404										
QRD161J-0R0	RESISTOR	R421 R423 R424 R425 R427 R428									6	
QRD161J-102	RESISTOR	R402 R403									2	
QRD161J-103	RESISTOR	R405										
QRD161J-152	RESISTOR	R419									1	
QRD161J-183	RESISTOR	R413										
QRD161J-332	RESISTOR	R416 R417									2	
QRD161J-472	RESISTOR	R410 R412									2	
QRD161J-681	RESISTOR	R418										
QRD161J-682	RESISTOR	R407 R415									2	
QRX029J-3R0A	QMF RESISTOR	R420 R422 R426										
QVZ3506-102	V RESISTOR	R406 R414										
QCF11HP-103	CAPACITOR	C410 C412									2	
QETA1AM-227	E CAPACITOR	C405									1	
QETA1CM-227	E CAPACITOR	C411										
QETA1CM-228	E CAPACITOR	C413										
QETA1EM-477	E CAPACITOR	C401 C402									2	
QETA1CM-338	E CAPACITOR	C406 C408										
QETA1EM-108	E CAPACITOR	C414									1	
QETA1EM-228	E CAPACITOR	C407 C409										
QFN41HJ-152	M CAPACITOR	C403 C404									2	
PU50597-3	CAP HOUSING	CN2										
PU50597-6	CAP HOUSING	CN1										
QMF51U1-R25	FUSE	F403									1	
QMF51U1-R63	FUSE	F401 F402									2	
PU51212	FUSE CLIP											
PGZ01166-017	HEAT SINK											
PU51306-3-2	CAUTION LABEL											
SDSP3006N	SCREW										7	
PGZ01169	POWER TRANSFORMER											
PGE40020-1-3	LINE FILTER BOARD	PWB										
PGZ00400	LINE FILTER										1	

PART NO.		PART NAME, DESCRIPTION		REF NO.								Q'TY
				1	2	3	4	5	6	7	8	

* VIDEO BOARD ASSEMBLY <03> *												

CX7930A	IC			IC58								1
HD440072	IC			IC55								1
SN7406	IC			IC82	IC87	IC107						3
SN7407	IC			IC106								1
SN74221	IC			IC84	IC85	IC94	IC96	IC97				5
SN74LS00	IC			IC79	IC109	IC119						3
SN74LS02	IC			IC115								1
SN74LS04	IC			IC40	IC78	IC83	IC88					4
SN74LS05	IC			IC114								1
SN74LS08	IC			IC80	IC95	IC117	IC118					4
SN74LS14	IC			IC98								1
SN74LS20	IC			IC92								1
NS74LS32	IC			IC104								1
SN74LS74A	IC			IC108								1
SN74LS112A	IC			IC101								1
SN74LS123	IC			IC77	IC89	IC99	IC100	IC103	IC116			6
SN74LS221	IC			IC81	IC91	IC93	IC102	IC110	IC111	IC112	IC113	8
SN74LS374	IC			IC26	IC27							2
SN74S124	IC			IC38								1
9602PC	IC			IC105								1
MC14049UB	IC			IC76	IC86							2
MC14053B	IC			IC19	IC53	IC75						3
FH-005	IC			IC41	IC62	IC66	IC67					4
FH-011	IC			IC37								1
AN612	IC			IC49	IC59	IC61	IC63					4
HA11247	IC			IC20								1
MN3106	IC			IC32								1
MN3801	IC			IC31								1
M51386L	IC			IC33	IC34							2
TX429M	IC			IC2	IC11	IC29	IC41					4
LF353N	IC			IC52								1
UPC4082C	IC			IC6	IC10	IC12	IC21	IC36	IC44	IC54	IC64	10
				IC65	IC68	IC69						11
UPC1458C	IC			IC8	IC14	IC15	IC23	IC30	IC42	IC47	IC70	8
MC1414P	IC			IC9	IC50	IC51						3
UA78L09AWC	IC			IC16	IC45	IC73						3
UA78L62AWC	IC			IC56								1
AN6308	IC			IC60								1
TA7347P	IC			IC1	IC3	IC28						3
TL607	IC			IC39	IC48							2
TL610	IC			IC5	IC13	IC22	IC35	IC43	IC46	IC57		7
UPC398C	IC			IC17	IC18							2
MB40578	IC			IC7	IC24	IC25						3
MB40778	IC			IC71	IC72							2

PART NO.	PART NAME, DESCRIPTION	REF NO. <----->								Q'TY
		1	2	3	4	5	6	7	8	
2SA1015GR	TRANSISTOR	Q4	Q8	Q17	Q21	Q23	Q26	Q33	Q34	
		Q41	Q44	Q46	Q57	Q60	Q66	Q69	Q75	
		Q78	Q79	Q81						19
2SA966	TRANSISTOR	Q15	Q54							2
2SC1815GR	TRANSISTOR	Q1	Q2	Q3	Q5	Q6	Q7	Q9	Q10	
		Q11	Q12	Q13	Q14	Q16	Q19	Q20	Q22	
		Q24	Q25	Q27	Q28	Q29	Q30	Q31	Q32	
		Q35	Q36	Q37	Q38	Q39	Q40	Q42	Q43	
		Q45	Q47	Q49	Q50	Q51	Q52	Q53	Q55	
		Q56	Q58	Q64	Q65	Q68	Q70	Q71	Q72	
		Q73	Q76	Q77	Q80	Q87	Q88			54
2SC2236Y	TRANSISTOR	Q59	Q61	Q62	Q63	Q67	Q74			6
2N5772	TRANSISTOR	Q48								1
2SK40-D	FET	Q18								1
MV2108	DIODE	D14	D26							2
MV2114	DIODE	D23								1
05Z5.1Y	DIODE	D5	D7	D16	D19	D21	D28	D35		7
05Z6.2X	DIODE	D9								1
05Z8.2Y	DIODE	D8								1
1N34A	DIODE	D2	D20	D32	D36	D37				5
1SZ57	DIODE	D17								1
1S1588	DIODE	D1	D6	D10	D11	D12	D13	D18	D22	
		D24	D25	D27	D30	D31	D33	D34	D42	
		D45	D46	D47	D48	D49				21
GL-3PG2	LED	D3								1
PGCZCQC1H680	CAPACITOR	C247								1
PGCODM2AC100	MICA CAPACITOR	C148	C150	C330	C357					4
PGCODM2AC150	MICA CAPACITOR	C56	C352							2
PGCODM2AC200	MICA CAPACITOR	C58	C63	C95	C100	C147	C169	C380		7
PGCODM2AC220	MICA CAPACITOR	C55	C410	C411	C413	C426	C428	C429		7
PGCODM2AC240	MICA CAPACITOR	C386								1
PGCODM2AC270	MICA CAPACITOR	C241								1
PGCODM2AC300	MICA CAPACITOR	C206								1
PGCODM2AC390	MICA CAPACITOR	C239	C268	C270						3
PGCODM2AC470	MICA CAPACITOR	C141								1
PGCODM2AC510	MICA CAPACITOR	C501								1
PGCODM2AC620	MICA CAPACITOR	C165								1
PGCODM2AC680	MICA CAPACITOR	C166	C611							2
PGCODM2AC750	MICA CAPACITOR	C85	C158	C160	C298	C306	C308			6
PGCODM2AC910	MICA CAPACITOR	C220	C24	C373	C375	C387	C389			6
PGCODM2AD101	MICA CAPACITOR	C4	C18	C26	C174	C175	C391	C412	C419	
		C423	C448	C471	C609					12
PGCODM2AD121	MICA CAPACITOR	C163	C213							2
PGCODM2AD131	MICA CAPACITOR	C21	C198	C349						3
PGCODM2AD151	MICA CAPACITOR	C159								1
PGCODM2AD161	MICA CAPACITOR	C441								1
PGCODM2AD181	MICA CAPACITOR	C23	C261	C265	C374	C388	C418	C421		7
PGCODM2AD201	MICA CAPACITOR	C164	C173	C466						3
PGCODM2AD221	MICA CAPACITOR	C36	C246							2

		REF NO. ----->								
PART NO.	PART NAME, DESCRIPTION	1	2	3	4	5	6	7	8	Q'TY
PGCODM2AD241	MICA CAPACITOR	C328	C355	C443	C473					4
PGCODM2AD271	MICA CAPACITOR	C230	C326	C329	C353	C354				5
PGCODM2AD301	MICA CAPACITOR	C477								1
PGCODM2AD331	MICA CAPACITOR	C232	C468							2
PGCODM2FD471	MICA CAPACITOR	C3	C348							2
PGCODM2FD511	MICA CAPACITOR	C57	C61	C84	C93	C96	C217	C299		7
PGCODM2FD621	MICA CAPACITOR	C307								1
PGCODM2FE102	MICA CAPACITOR	C424								1
PGC1CQ92X102	CPACITOR	C183	C402	C405	C406	C452	C459			6
PGC1CQ92X152	CAPACITOR	C454								1
PGC1CQ92X222	CAPACITOR	C438	C465							2
PGC1CQ92Y103	CAPACITOR	C44	C415	C416	C435	C437	C441	C444	C461	9
PGC1MC1HA104	CAPACITOR	C30	C33	C52	C65	C102	C401			6
PGC1MC1HX102	CAPACITOR	C129	C242	C271	C610					4
PGC1MC1HX152	CAPACITOR	C155								1
PGC1MC1HX222	CAPACITOR	C238	C434							2
PGC1MC1HX332	CAPACITOR	C455								1
PGC1MC1HX472	CAPACITOR	C130	C181							2
PGC1MC1HY103	CAPACITOR	C79	C80	C92	C121	C123	C125	C207	C222	1
PGC1MC1HY223	CAPACITOR	C236	C240	C263	C267	C278	C289	C310	C311	1
PGC1MC1HY333	CAPACITOR	C318	C319							18
PGC1MC1HY473	CAPACITOR	C447	C457							2
PGC2A1FA104Z	CAPACITOR	C53	C433	C458						3
PGC2C45C330K	E CAPACITOR	C252								1
PGC3TC1EC220	E CAPACITOR	C602	C604							2
PGC3TC1VA474	E CAPACITOR	C224	C225							2

PART NO.	PART NAME, DESCRIPTION	REF NO.										Q'TY
		1	2	3	4	5	6	7	8			
PGC3TC1VB1R0	E CAPACITOR	C64	C103	C244	C245	C439	C503	C601	C603		8	
PGC3TC1VB2R2	E CAPACITOR	C145	C146	C233	C235						4	
PGC3TC1VB4R7	E CAPACITOR	C133	C135	C172							3	
PGC4EVOJC470	E CAPACITOR	C221	C431	C432							3	
PGC4EVOJD101	E CAPACITOR	C68	C70	C72	C73	C106	C131	C211	C228		18	
		C287	C362	C364	C395	C396	C400	C404	C409		4	
		C425	C462								18	
PGC4EVOJD221	E CAPACITOR	C339	C363	C399	C469						4	
PGC4EV1CC100	E CAPACITOR	C1	C2	C9	C10	C14	C111	C113	C117		4	
		C184	C194	C464							11	
PGC4EV1CC220	E CAPACITOR	C83	C138	C301	C378	C608					5	
PGC4EV1CC330	E CAPACITOR	C480									1	
PGC4EV1CC470	E CAPACITOR	C6	C89	C139	C170	C204	C205	C212	C292		9	
		C450									9	
PGC4EV1CD101	E CAPACITOR	C16	C17	C25	C35	C37	C47	C48	C69		2	
		C71	C87	C108	C109	C110	C118	C119	C124		2	
		C151	C179	C185	C191	C193	C210	C248	C250		2	
		C251	C256	C257	C284	C286	C313	C314	C315		2	
		C321	C322	C331	C334	C336	C342	C345	C346		2	
		C347	C358	C361	C370	C371	C372	C381	C382		2	
		C383	C408	C476	C478	C479	C500	C502			55	
PGC4EV1EB4R7	E CAPACITOR	C54	C88	C226	C227						4	
PGC4EV1HB1R0	E CAPACITOR	C365	C366	C394							3	
PGC4EV1HB3R3	E CAPACITOR	C5	C430								2	
PGC51ZW1053	V CAPACITOR	VC7									1	
PGC51ZW2053	V CAPACITOR	VC1	VC2	VC4	VC11	VC13					5	
PGC51ZW4053	V CAPACITOR	VC3	VC5	VC6	VC9	VC10	VC12	VC14			7	
PGDOCU4JC100	RESISTOR	R539									1	
PGDOCU4JC220	RESISTOR	R301	R352	R360	R364	R396					5	
PGDOCU4JC470	RESISTOR	R285	R401								2	
PGDOCU4JC680	RESISTOR	R3	R6	R30	R45	R66	R71	R73	R76		1	
		R77	R78	R86	R99	R101	R103	R133	R134		2	
		R137	R146	R155	R156	R157	R160	R161	R172		2	
		R186	R192	R197	R202	R205	R208	R225	R229		2	
		R243	R319	R335	R341	R343	R351	R361	R368		2	
		R373	R380	R394	R406	R411	R416	R423	R441		2	
		R445	R451	R458	R459	R464	R472	R476	R482		2	
		R484	R601								58	
PGDOCU4JC750	RESISTOR	R15	R177	R331	R358	R359	R374	R397	R400		12	
		R402	R420	R463	R999						12	
PGDOCU4JC820	RESISTOR	R645									1	
PGDOCU4JD101	RESISTOR	R142	R171	R203	R216	R239	R241	R256	R260		1	
		R266	R275	R308	R310	R321	R323	R470			15	
PGDOCU4JD151	RESISTOR	R139	R309								2	
PGDOCU4JD221	RESISTOR	R27	R187	R363	R409	R477	R505				6	
PGDOCU4JD301	RESISTOR	R32	R42	R94	R98	R127	R128	R184	R185		14	
		R218	R350	R354	R369	R442	R443				14	
PGDOCU4JD331	RESISTOR	R235	R265								2	
PGDOCU4JD361	RESISTOR	R104	R381	R386	R414	R415	R425	R427			7	
PGDOCU4JD431	RESISTOR	R41	R454								2	
PGDOCU4JD471	RESISTOR	R9	R70	R169	R170	R448	R642				6	
PGDOCU4JD511	RESISTOR	R314	R403	R404	R405	R407					5	

PART NO.	PART NAME, DESCRIPTION	REF NO.								Q'TY
		1	2	3	4	5	6	7	8	
PGDOCU4JD561	RESISTOR	R199	R210	R326	R480					4
PGDOCU4JD681	RESISTOR	R28	R83	R118	R119	R162	R183	R209	R228	
		R234	R253	R286	R287	R417				13
PGDOCU4JD751	RESISTOR	R37								1
PGDOCU4JD821	RESISTOR	R74	R332	R353	R392	R408	R450	R544		7
PGDOCU4JD911	RESISTOR	R29	R479							2
PGDOCU4JE102	RESISTOR	R14	R31	R47	R50	R59	R64	R90	R91	
		R112	R115	R116	R138	R145	R148	R154	R175	
		R178	R191	R212	R217	R219	R232	R233	R234	
		R244	R255	R257	R258	R262	R293	R294	R295	
		R297	R299	R303	R306	R317	R328	R337	R375	
		R382	R393	R449	R466	R467	R495	R536	R540	
		R543	R633	R634	R635	R637	R643			54
PGDOCU4JE122	RESISTOR	R152	R195	R355	R356	R357	R376	R377	R398	
		R399	R418	R419	R461	R462				13
PGDOCU4JE132	RESISTOR	R81	R478							2
PGDOCU4JE152	RESISTOR	R26	R120	R455						3
PGDOCU4JE162	RESISTOR	R79								1
PGDOCU4JE182	RESISTOR	R25	R53	R61	R100	R102	R135	R136	R481	8
PGDOCU4JE202	RESISTOR	R38	R48	R49	R55	R68	R92	R97	R125	
		R129	R132	R189	R231	R251	R271	R291	R316	
		R340	R348	R365	R452	R468	R475	R534	R542	
		R545								25
PGDOCU4JE222	RESISTOR	R7	R51	R63	R67	R124	R163	R201	R215	
		R242	R263	R283	R302	R322	R346	R349	R370	
		R371	R641							18
PGDOCU4JE242	RESISTOR	R18	R56	R84	R140	R147	R173	R179	R188	
		R222	R227	R230	R238	R240	R248	R296	R298	
		R313	R329	R336	R344	R372	R410	R413	R440	
		R444	R460	R471	R533					28
PGDOCU4JE272	RESISTOR	R2	R46	R190	R312	R383	R387	R428	R432	8
PGDOCU4JE302	RESISTOR	R69	R174	R345	R367	R512				5
PGDOCU4JE332	RESISTOR	R4	R85	R111	R200	R207	R318	R325	R328	
		R338	R529							10
PGDOCU4JE362	RESISTOR	R93	R126	R220	R264	R384	R429			6
PGDOCU4JE392	RESISTOR	R284	R522	R571						3
PGDOCU4JE432	RESISTOR	R424	R499	R514						3
PGDOCU4JE472	RESISTOR	R24	R52	R62	R65	R110	R153	R206	R269	
		R288	R289	R290	R304	R320	R342	R362	R385	
		R395	R412	R430	R437	R465	R491	R506	R521	
		R526	R541							26
PGDOCU4JE512	RESISTOR	R109	R114	R224	R549					4
PGDOCU4JE562	RESISTOR	R113	R339	R426	R446	R447	R453	R524	R535	
		R537	R640							10
PGDOCU4JE622	RESISTOR	R548								1
PGDOCU4JE682	RESISTOR	R96	R117	R130	R488	R517				5
PGDOCU4JE752	RESISTOR	R72	R315	R490						3
PGDOCU4JE822	RESISTOR	R1	R5	R530						3
PGDOCU4JE912	RESISTOR	R122								1
PGDOCU4JF123	RESISTOR	R57	R58	R123	R223	R254	R515	R528		7
PGDOCU4JF133	RESISTOR	R40								1

PART NO.	PART NAME, DESCRIPTION	REF NO. <----->								Q'TY
		1	2	3	4	5	6	7	8	
PGDOCU4JF103	RESISTOR	R21	R89	R121	R141	R149	R150	R151	R165	
		R167	R168	R182	R196	R213	R214	R259	R261	
		R270	R276	R277	R324	R379	R422	R439	R483	
		R510	R525	R547	R550	R636	R638	R639		31
PGDOCU4JF153	RESISTOR	R193	R497	R507	R546	R551	R552			6
PGDOCU4JF163	RESISTOR	R60	R75	R489						3
PGDOCU4JF183	RESISTOR	R95	R131	R519						3
PGDOCU4JF203	RESISTOR	R511	R527	R531						3
PGDOCU4JF223	RESISTOR	R236	R246	R292	R500					4
PGDOCU4JF303	RESISTOR	R54	R282	R496	R509					4
PGDOCU4JF333	RESISTOR	R13	R19	R22	R34	R249	R508	R516		7
PGDOCU4JF363	RESISTOR	R80	R164	R570						3
PGDOCU4JF393	RESISTOR	R159	R523							2
PGDOCU4JF473	RESISTOR	R221	R268							2
PGDOCU4JF513	RESISTOR	R538	R558							2
PGDOCU4JF563	RESISTOR	R36	R194	R273	R513	R532				5
PGDOCU4JF623	RESISTOR	R35								1
PGDOCU4JF683	RESISTOR	R39	R267	R272						3
PGDOCU4JF753	RESISTOR	R278	R518							2
PGDOCU4JG104	RESISTOR	R8	R12	R20	R23	R33	R226	R237	R280	
		R485	R486	R487						11
PGDOCU4JG154	RESISTOR	R274	R311	R347	R366	R632				5
PGDOCU4JG204	RESISTOR	R82								1
PGDOCU4JH105	RESISTOR	R16	R17	R87	R88	R143	R144	R180	R181	
		R279	R281	R300						11
PGD1MR4F1302	RESISTOR	R389	R433							2
PGD1MR4F3302	RESISTOR	R388	R434							2
PGD1MU4D3480	RESISTOR	R176	R198	R330	R456	R457	R473	R474		7
PGD1MU4E1001	RESISTOR	R250	R252							2
PGD1MU4E2001	RESISTOR	R106	R494	R520						3
PGD1MU4E2201	RESISTOR	R492	R493	R501	R502	R503	R504			6
PGD1MU4E2401	RESISTOR	R44	R247							2
PGD1MU4E3001	RESISTOR	R105								1
PGD1MU4E3301	RESISTOR	R438								1
PGD1MU4E3601	RESISTOR	R108								1
PGD1MU4E4301	RESISTOR	R436								1
PGD1MU4E4701	RESISTOR	R107								1
PGD1MU4E5601	RESISTOR	R211	R391	R435						3
PGD1MU4F1102	RESISTOR	R390	R431							2
PGD1MU4F1502	RESISTOR	R43	R245							2
PGD1MU4F3002	RESISTOR	R498								1
PGD4C6PD201	V RESISTOR	VR45	VR47							2
PGD4C6PD301	V RESISTOR	VR27	VR30							2
PGD4C6PD501	V RESISTOR	VR15	VR17	VR18	VR21	VR44	VR54	VR55	VR56	
		VR57	VR58							10
PGD4C6PE102	V RESISTOR	VR4	VR10	VR29	VR46	VR51	VR59			6
PGD4C6PE202	V RESISTOR	VR13	VR19	VR22	VR23	VR25	VR26	VR33	VR43	
		VR50	VR53	VR68	VR75	VR76				13
PGD4C6PE302	V RESISTOR	VR40	VR73							2

PART NO.	PART NAME, DESCRIPTION	REF NO.										Q'TY
		1	2	3	4	5	6	7	8			
PGD4C6PE502	V RESISTOR	VR9	VR12	VR14	VR20	VR31	VR35	VR36	VR38			
		VR39	VR41	VR48	VR49	VR62	VR63	VR70	VR71			
		VR72									17	
PGD4C6PF103	V RESISTOR	VR16	VR28	VR32	VR34	VR42	VR61	VR67	VR69		8	
PGD4C6PF203	V RESISTOR	VR24	VR52	VR60	VR66						4	
PGD4C6PF503	V RESISTOR	VR64	VR65								2	
PGD4C6PG104	V RESISTOR	VR37									1	
PGD4C6XE502	V RESISTOR	VR11									1	
PGD4J20PE502	V RESISTOR	VR6	VR7	VR8							3	
PGD40AS15B14	V RESISTOR	VR1	VR2	VR3	VR5						4	
PGD5TDK1023Q	THERMISTOR	TH1									1	
PGE1EP111500	TRANSFORMER	T1									1	
PGE2FL4HB4R7	INDUCTOR	L20									1	
PGE2FL4HB5R6	INDUCTOR	L42									1	
PGE2FL4HB6R8	INDUCTOR	L2	L33								2	
PGE2FL5HC150	INDUCTOR	L4	L50								2	
PGE2FL5HC270	INDUCTOR	L39									1	
PGE2FL5HC330	INDUCTOR	L19	L25	L34							3	
PGE2FL5HC390	INDUCTOR	L51									1	
PGE2FL5HC680	INDUCTOR	L1	L29	L35							3	
PGE2FL5HD101	INDUCTOR	L6	L7								2	
PGE2FL5HD181	INDUCTOR	L24									1	
PGE2FL7HD101	INDUCTOR	L8	L17	L18	L36	L43					5	
PGE2SN5300	INDUCTOR	L30	L31	L32							3	
PGE3P0076	INDUCTOR	L21									1	
PGE3P0085	INDUCTOR	L12									1	
PGE3P0102	INDUCTOR	L27	L28								2	
PGE3P1046	INDUCTOR	L22	L23								2	
PGE3P1047	INDUCTOR	L3	L5	L10	L11	L13	L15	L16	L37		11	
		L38	L40	L41							1	
PGE3P1130	INDUCTOR	L26									1	
PGE3P1131	INDUCTOR	L9									1	
PGE3P1141	INDUCTOR	L14									1	
PGE4D351151I	DELAY LINE	DL3	DL5								2	
PGE4D351201I	DELAY LINE	DL1	DL2	DL4							3	
PGF2AS12AP	SWITCH	S5	S13								2	
PGF2SSSS342	SWITCH	S12									1	
PGF3A12AV	SWITCH	S1	S2	S3	S4	S7	S8	S9	S10		9	
		S11									1	
PGF6AB15AV	SWITCH	S6									1	
PGF6AT475R	SWITCH	S6									1	
PGF9G5A234P	RELAY, DC 12V	RY1	RY2	RY3	RY4	RY5					5	
PGG3TN50P6PL	CONNECTOR	J10									1	
PGG3XJ8A0211	CONNECTOR	JP15									1	
PGG3XJ8D0311	CONNECTOR	JP15									1	
PGG315PS3T2	CONNECTOR	J8									1	

PART NO.		PART NAME, DESCRIPTION		REF NO.												Q'TY	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
PGG33PS3T2	CONNECTOR			J3	J4	J11										3	
PGG34PS3T2	CONNECTOR			J2	J6	J9										3	
PGG35PS3T2	CONNECTOR			J7	J8	J1										1	
PGG36PS3T2	CONNECTOR			J11	J5	J8										2	
PGG5LC2SBK	TEST-PIN, BLACK			TP1	TP2	TP3	TP7	TP11	TP13	TP17	TP20						
PGG5LC2SOR	TEST-PIN, ORANGE			TP22	TP25	TP28	TP30	TP32	TP36	TP37	TP40						
				TP41												17	
				TP4	TP5	TP6	TP8	TP9	TP10	TP12	TP14						
				TP15	TP16	TP18	TP19	TP21	TP23	TP24	TP26						
				TP27	TP29	TP31	TP33	TP34	TP35	TP38	TP39					24	
PGG63114#2	IC SOCKET			CN1	CN2	CN3	CN4	CN5	CN6							6	
PGG63114#2RK	IC SOCKET			CN1	CN2	CN3	CN4	CN5	CN6								
PGG6870803S4	IC SOCKET			IC7	IC24	IC25	IC32										
PGG6871403S4	IC SOCKET			IC7	IC24	IC25	IC32										
PGG6871803S4	IC SOCKET			IC71	IC72	IC74											
PGG6872806S4	IC SOCKET			IC55													
PGZZ7KCASE	OTHERS			R174													
PGZ3C081LGB	KNOB			VR1	VR2	VR3	VR4										
PGZ3NR10031	KNOB			VR1	VR2	VR3	VR4										
PGZ6P0040	CRYSTAL			XTAL2													
PGZ635795	CRYSTAL, 3.579545MHz			XTAL1													

PGG4EKO10101	IC CAPACITOR																

* MEMORY BOARD ASSEMBLY <05> *																	

PM-2314	IC APACITOR			1D													
PM-2315	IC TAL CAPACITOR			2B													
PM-2316-1	IC APACITOR			2E													
PM-2317	IC			4E													
PM-2318	IC			5B													
PM-2319	IC			7B													
PM-2320	IC			7C													
PM-2321	IC			7G	7F												
SN74LS00	IC			8H	9G	9N											
SN74LS02	IC			6H													
SN74LS04	IC			3G	8B	9P	9U										
SN74LS05	IC			IC2													
SN74LS08	IC			8J	9F												
SN74LS32	IC			9D													
SN74LS74A	IC			2G	4A	8C	4B	8C	8E	9A	9H	9J	9T				
SN74LS86	IC			9K													
SN74LS112A	IC			8G													
SN74LS153	IC			5D	5E	5F	5G	9E									

PART NO.		PART NAME, DESCRIPTION		1	2	3	4	5	6	7	8	Q'TY
SN74LS157	IC			3A	6D	6E	7D	8A	8D			6
SN74LS163A	IC			1F	1G							2
SN74LS164	IC			1C1	3J	5A	8F	9C				5
SN74LS166A	IC			3M	3K	3R	3N	3U	3S	3X	3V	
				5.6M	5.6K	5.6R	5.6N	5.6U	5.6S	5.6X	5.6V	
SN74LS174	IC			8M	8K	8R	8N	8U	8S	8X	8V	24
				2F	5C							2
SN74LS221	IC			9R	9X							2
SN74LS244	IC			2H	2J	5J	7J					4
SN74LS273	IC			2A	4H	9B						3
SN74LS283	IC			6F	6G							2
SN74LS374	IC			4D								1
SN74LS393	IC			4C	4F							2
SN74S00	IC			10C								1
SN74S124	IC			10E								1
74F04	IC			1E	3D	10D						3
74F74	IC			3E								1
74F163	IC			2C	2D	6A	6B	6C				5
74F244	IC			5H	7H							2
74F273N	IC			9A	10A							2
74F374	IC			1A	7A							2
TC74HC14P	IC			1H								1
TC74HC74P	IC			9M								1
TC74HC595P	IC			2M	2K	2R	2N	2U	2S	2X	2V	
				5M	5K	5R	5N	5U	5S	5X	5V	
				7M	7K	7R	7N	7U	7S	7X	7V	24
TD74BC244P	IC			3F								1
MB3771	IC, DIP-8P-M01			9L								1
UPC1458C	IC			10S								1
MC1414P	IC			10N								1
UA7805UC	IC			REG1								
MC4044P	IC			10F								
M5M4464P-12	IC, 64K*4			1K	1L	1M	1N	1P	1R	1S	1T	
				1U	1V	1W	1X	4K	4L	4M	4N	
				4P	4R	4S	4T	4U	4V	4W	4X	
				6K	6L	6M	6N	6P	6R	6S	6T	
				6U	6V	6W	6X					
UPD41101C-3	IC, 910*8			1B								
HM6147P	IC, 4K*1			7E								
2SC372GTM	TRANSISTOR			Q1	Q2							2
1S1588	DIODE			D1	D2	D3	D4					
GL-3PG1	LED			LED1	LED2							
PGCODM2AC120	MICA CAPACITOR			C28								
PGCODM2AC200	MICA CAPACITOR			C30	C31	C32						3
PGCODM2AD201	MICA CAPACITOR			C600								1
PGCODM2AD221	MICA CAPACITOR			C8								
PGCODM2FD681	MICA CAPACITOR			C13								

PART NO.	PART NAME, DESCRIPTION	REF NO.								QTY
		1	2	3	4	5	6	7	8	
PGC1MC1HA104	CAPACITOR	C19								1
PGC1MC1HX102	CAPACITOR	C26	C27							2
PGC1MC1HX222	CAPACITOR	C17								1
PGC1MC1HX472	CAPACITOR	C14								1
PGC1MC1HY103	CAPACITOR	C15								1
PGC1MC1HY473	CAPACITOR	C12								1
PGC2A0FA104Z	CAPACITOR	C2	C5	C7	C10	C18	C21	C22	C23	1
		C24	C25	C70	C71	C72	C73	C74	C75	1
		C76	C77	C78	C79	C80	C81	C82	C83	1
		C84	C85	C86	C87	C88	C89	C90	C91	1
		C92	C93	C94	C95	C96	C97	C98	C99	1
		C100	C101	C102	C103	C104	C105	C106	C107	1
		C108	C109	C110	C111	C112	C113	C114	C115	1
		C116	C117	C118	C119	C120	C121	C122	C123	1
		C124	C125	C126	C127	C128	C129	C130	C131	1
		C132	C133	C134	C135	C136	C137	C138	C139	1
		C140	C141	C142	C143	C144	C145	C146	C147	1
		C148	C149	C150	C151	C152	C153	C154	C155	1
		C156	C157	C158	C159	C160	C161	C162	C163	1
		C164	C165	C166	C167	C168	C169	C170	C171	1
		C172	C173	C174	C175	C176	C177	C178	C179	1
		C180	C181	C182	C183	C184	C185	C186	C187	1
		C188	C189	C190	C191	C192	C193	C194	C195	1
		C196	C197	C198	C199	C200	C201	C202	C203	1
		C204	C205	C206	C207	C208	C209	C210	C211	1
		C212	C213	C214	C215	C216	C218	C219	C220	1
		C221	C222	C223						163
PGC3TC1VA104	E CAPACITOR	C11	C16							2
PGC3TC1VB1R0	E CAPACITOR	C6								1
PGC4EKOJD101	E CAPACITOR	C1	C3	C20	C29	C50	C51	C52	C53	1
		C54	C55	C56	C57	C58	C59	C60	C61	21
		C62	C63	C64	C65	C66				21
PGC4EK1CD101	E CAPACITOR	C4	C9	C217						3
PGC4EK1EB3R3	E CAPACITOR	C33	C34							2
QEB41AM-475	TANTAL CAPACITOR	C999								1
PGC51ZW2053	V CAPACITOR	VC1								1
PGDOCR4JB2R4	RESISTOR	R20								1
PGDOCR4JC100	RESISTOR	R44	R45	R46	R47	R48	R49	R50	R51	1
		R52	R53	R54	R55	R56	R57	R58	R59	1
		R60	R61	R62	R63	R64	R65	R66	R67	1
		R68	R69	R70	R71	R72	R73	R74	R75	1
		R76	R78	R79						35
PGDOCR4JC750	RESISTOR	R23								1
PGDOCR4JD101	RESISTOR	R15								1
PGDOCR4JD151	RESISTOR	R19								1
PGDOCR4JD221	RESISTOR	R21	R28	R32	R38	R41				5
PGDOCR4JD331	RESISTOR	R42	R43							2
PGDOCR4JD471	RESISTOR	R6	R8	R29						3
PGDOCR4JD561	RESISTOR	R31								1
PGDOCR4JE102	RESISTOR	R16								1
PGDOCR4JE152	RESISTOR	R26	R30							2
PGDOCR4JE202	RESISTOR	R36								1

PART NO.		PART NAME, DESCRIPTION		REF NO.								Q'TY
PGDOCR4JE222	RESISTOR			R9	R18	R22	R25	R33	R37	R39	R40	1
PGDOCR4JE332	RESISTOR			R12	R13							2
PGDOCR4JE392	RESISTOR			R27								1
PGDOCR4JE472	RESISTOR			R77								1
PGDOCR4JE562	RESISTOR			R17	R34							2
PGDOCR4JF103	RESISTOR			R1	R2	R3	R4	R7	R11	R14		7
PGDOCR4JF123	RESISTOR			R35								1
PGDOCR4JF223	RESISTOR			R24								1
PGDOCR4JG104	RESISTOR			R5	R10							2
PGD1MR1JC470	RESISTOR			R80								1
PGD3AU4JE472	RESISTOR ARRAY			RA10	RA20							2
PGD4C6XE502	1V RESISTOR			VR10								1
PGD4C6XG104	5V RESISTOR			VR20								1
PGE1EP111500	TRANSFORMER			T1								1
PGE2FL7HD101	INDUCTOR			L20								1
PGE2SN5300	INDUCTOR			L17								1
PGE4ADL050SE	DELAY LINE			DL-1	DL-2							2
PGF3A12JH	SWITCH			SW1	SW2	SW6						3
PGF5S1011	SWITCH			SW5								1
PGF6AB15AV	SWITCH			SW3	SW4							2
PGF6AT475R	SWITCH			SW3	SW4							2
PGG3TN50P3PL	CONNECTOR			J3								1
PGG3TN50P4PL	CONNECTOR			J2								1
PGG33PS3L2	CONNECTOR			J1								1
PGG5LC2SBK	TEST-PIN, BLACK			GND	GND	GND	GND	GND	GND			6
PGG63114#2	IC SOCKET			CN1	CN2	CN3	CN4	CN5	CN6	CN7		7
PGG63114#2RK	IC SOCKET			CN1	CN2	CN3	CN4	CN5	CN6	CN7		7
PGG6872003S4	IC SOCKET			1D	2B	2E	4E	5B	7B	7C	7G	9
PGZ00354	FERRITE BEARS			7F								9

* REMOTE BOARD ASSEMBLY <06> *												

PGC4EN1HB1R0	E CAPACITOR			C1	C2	C3	C4	C5	C6	C7	C8	8
PGDOCR4JE122	RESISTOR			R1	R2	R3						3
PGD5Z03DK220	VARISTOR			ZR1	ZR2	ZR3	ZR4	ZR5	ZR6	ZR7	ZR8	11
				AR9	ZR10	ZR11						11
PGG2D204182	CONNECTOR			-	-	-	-					4
PGG3DB25ST	CONNECTOR			J1								1
PGG315PS3T2	CONNECTOE			J2								1

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		REF NO.											
PART NO.	PART NAME, DESCRIPTION	1	2	3	4	5	6	7	8	Q	TY		
QRD167J-222	RESISTOR	R252	R253	R254	R348	R377					5		
QRD167J-272	RESISTOR	R311	R319	R334	R354	R368	R384	R391			7		
QRD167J-332	RESISTOR	R341	R350	R379							3		
QRD167J-391	RESISTOR	R6	R207	R209	R223	R225	R239	R241	R308				
		R313	R315	R331	R365	R382					13		
QRD167J-392	RESISTOR	R314									1		
QRD167J-4R7	RESISTOR	R321	R322								2		
QRD167J-470	RESISTOR	R393	R394								2		
QRD167J-471	RESISTOR	R302	R304	R307	R325	R327	R330	R338	R359				
		R361	R364	R372	R374						12		
QRD167J-472	RESISTOR	R1	R2	R3	R4	R5	R345	R388	R389		8		
QRD167J-473	RESISTOR	R203	R214	R219	R230	R235	R246				6		
QRD167J-680	RESISTOR	R7	R8	R107	R323						4		
QRD167J-820	RESISTOR	R104	R105	R106							3		
QVZ3507-101	V RESISTOR	R373									1		
QVZ3507-221	V RESISTOR	R305	R318	R353	R362	R383					5		
QVZ3507-471	V RESISTOR	R201	R217	R233	R309	R332	R366				6		
EXB-P84472M	RESISTOR ARRAY	RA1									1		
PU58948-104	CAPACITOR	C3	C5	C6	C8	C9	C10	C11	C12				
		C14	C16	C17	C18	C19	C21	C22	C23				
		C24	C26	C27	C28	C101	C103	C105	C106				
		C107	C108	C110	C111	C112	C114	C117	C118				
		C119	C121	C124	C125	C126	C128	C131	C132				
		C133	C202	C204	C210	C212	C218	C220	C301				
		C302	C317	C318	C338	C339	C350	C362			55		
QCT05CH-330	CAPACITOR	C225	C226	C227							3		
QCT05CH-470	CAPACITOR	C303	C319	C340	C351						4		
QEB41AM-106	TANTAL CAPACITOR	C307	C308	C311	C312	C323	C324	C331	C334				
		C344	C345	C354	C356	C369					13		
QEB41AM-475	TANTAL CAPACITOR	C134	C135	C136							3		
QEB41CM-106	TANTAL CAPACITOR	C337	C359								2		
QEB41CM-475	TANTAL CAPACITOR	C4	C7	C13	C15	C20	C25	C104	C115				
		C122	C129								10		
QEB41EM-105	TANTAL CAOACITOR	C113	C120	C127							3		
QEN41CM-476	NP E CAPACITOR	C332	C333	C346							3		
QEPA1CM-106	E CAPACITOR	C335	C336	C355	C357	C358					5		
QER41AM-107	E CAPACITOR	C304	C305	C306	C309	C313	C320	C321	C322				
		C325	C326	C327	C328	C329	C330	C341	C342				
		C343	C347	C349	C352						20		
QER41AM-476	E CAPACITOR	C116	C123	C130	C201	C203	C206	C207	C208				
		C209	C211	C214	C215	C216	C217	C219	C222				
		C223	C224								18		
QER41CM-476	E CAPACITOR	C348	C353								2		
QETA1AM-108	E CAPACITOR	C316									1		
QETA1AM-227	E CAPACITOR	C102	C109	C314	C315	C360	C361	C365	C366				
		C367	C368	C370							11		
QETA1AM-337	E CAPACITOR	C205	C213	C221							3		
QETA1AM-476	E CAPACITOR	C228	C229	C230							3		
QETA1AM-477	E CAPACITOR	C310									1		

PART NO.	PART NAME, DESCRIPTION	REF NO. <----->								Q' TY
		1	2	3	4	5	6	7	8	
QETA1CM-227	E CAPACITOR	C1	C2	C363	C364					4
PGZ01161-223	EMI FILTER	LC1	LC101	LC301	LC302	LC303				5
PGZ01162	DELAY LINE	DL301	DL303	DL304						3
PGZ01163	DELAY LINE	DL302								1
PGZ01164	LOW PASS FILTER	LPF301								1
PGZ01165	LOW PASS FILTER	LPF201	LPF202	LPF203						3
PGZ00354	FERRITE BEADS	K1	K2	K3	K4	K101	K102	K103	K104	29
		K201	K202	K203	K204	K205	K206	K301	K302	
		K303	K304	K305	K306	K307	K308	K309	K310	
		K311	K312	K313	K314	K315				
PGZ01166-046	SWITCH	SW1								1
PGZ01166-047	SWITCH	SW2								1
PGZ01166-048	SWITCH	SW3								1
PU54440	SWITCH	SW4	SW5							2
PGZ01166-049	IC SOCKET	CN1	CN2	CN3	CN5					4
PGZ01166-052	IC SOCKET	IC81								1
PGZ01166-050	CAP HOUSING	CN4	CN7	CN8						3
PGZ01166-051	CAP HOUSING	CN6								1
PGZ00587-00	TEST PIN, BLACK									12
PGZ00587-03	TEST PIN, ORANGE									11

 * CHROMA BLANKING BOARD ASSEMBLY <08> *

PRK40004A-01	C. BLK BOARD ASSY	PWBA								1
M74LS08P	IC	IC2								1
SN74LS221N	IC	IC1								1
QRD167J-123	RESISTOR	R4								1
QRD167J-472	RESISTOR	R2								1
QVPB606-203	V RESISTOR	R1								1
QVPB606-502	V RESISTOR	R3								1
PU58948-104	CAPACITOR	C4	C5							2
QCT05CH-101	CAPACITOR	C2								1
QEE41AM-685	TANTAL CAPACITOR	C1								1
QFN41HJ-102	M CAPACITOR	C3								1
PGZ00776-002	BOARD TO BOARD PIN	CN1	CN2	CN3	CN4					4

JVC PROFESSIONAL PRODUCTS COMPANY DIVISION OF US JVC CORP.

Head office	: 41 Slater Drive, Elmwood Park, New Jersey 07407	(201)794-3900
(East Coast)		
Midwest	: 2250 Lively Blvd., Elk Grove Village, Illinois 60007	(312)364-9300
West Coast	: 1011 West Artesia Blvd., Compton, California 90220	(213)637-2623
Southwest	: 407 Garden Oaks Blvd., Houston, Texas 77018	(713)694-0666

JVC CANADA INC.

Head office	: 21 Finchdene Square Scarborough, Ontario M1X 1A7	(416)293-1311
Vancouver	: 13040 Worster Court Richmond B.C. V6V 2B3	(604)270-1311

JVC



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